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Trial proves a winner

Tough tests bring radio modem first

By Peter Scott

NORTH RYDE, NSW — The tough testing ground chosen for a recently released Australian radio modem is believed to have generated a motor racing first for Netcomm (Australia) Pty Ltd.

The company has installed the Radio Smart Modem in a Nissan Skyline 2.4 Turbo racing car as an integral part of an engine and equipment monitoring system. Similar systems have been tested with Formula I racing cars, but a Netcomm spokesman said he was not aware of any such system that was still being routinely used.

At present Netcomm's system is still in a development phase and monitors only the car's onboard instruments. Readings from the Nissan's gauges are fed into a data acquisition box via an RS-232 port and are converted into digital form. Output from the data acquisition box is fed into the radio modem which passes the signals on to a UHF radio transceiver for transmission.

Murray Carter's turbo charged Nissan racing car cornering at top pace puts Netcomm's new radio modem through a tough test under harsh racetrack conditions, and scores a first in the process.

Realistic

In the pits the radio signals are picked up by another transceiver and fed through a radio modem into a personal computer.

The spokesman said that the link is good enough to get 1200bits/sec data transfers, but in the hostile environment of a racing car on the track, it was more realistic to expect half of that.

In its early phase the system operates well, the spokesman claimed. The car's existing engine management system is not designed to have output feeds, so the next step is to put 10 or more additional sensors on the system to monitor such parameters as fuel mixture, tyre surface temperature via infra-red sensors, and turbo boost pressure.

A database of relevant parameters is being established to run on the personal computer in the pits and to provide relative information on the car's expected performance.

In addition a small computer will be placed within the driver's sight to relay warnings or advice from the pits where the car's vital organs are being monitored.

"The concept has been proved and we're now turning it into a full scale usable system."

The car's drivers, Murray Carter and Denis Horley, have used the system in the course of several races, but believe its toughest test may come on the hilly track at Bathurst in October.

The spokesman noted that uses of the radio modem are far broader than simply race tracks. "The Radio Smart Modem, which costs just under $A2000, operates on any two way radio system, including UHF and VHF frequency modulation through to high frequency SSB systems," the spokesman said. "Typically data would be entered into any piece of data terminal equipment, such as a portable terminal, data logger, or telemetry equipment that is RS-232 compatible, and sent by radio modem via the two way radio system.

"The radio base receiver receives the data and another radio modem transmits it by phone modem to the host computer. If the base station is situated with the host it can be directly wired via RS-232 cabling."

The spokesman noted that the Education Department of Victoria uses an intelligent radio data modem with its high frequency radio network to enable students in remote areas to communicate with their tutors. Such communications previously involved expensive STD phone calls.

Motorists get phone expressway

MELBOURNE — Victoria's State Insurance Office has installed an integrated automatic call distribution (ACD) system believed to be the first of its kind in the State and the largest of its kind in Australia.

The facility is being used to help telephonists at the SIO, which is one of Victoria's largest motor vehicle insurers, cope with up to 4500 incoming calls each day by distributing the majority of the calls evenly around a number of operators in several departments.

The recently installed system is integrated with a Neax 2400 from NEC Australia. The ACD subsystem handles call connections and a management information system collects and displays various operating data.

The incoming calls to SIO's listed number are answered by the office's telephonists, who direct most of the calls into one of 10 separate phone circuits or "splits" serving various departments, a spokesman explained. Seven of the 10 splits are connected to the SIO's most heavily demanded services of motor vehicle quotes, renewals and claims.

The ACD automatically distributes these calls evenly around some 90 agent phones on a first-in first-out basis. Calls are handled in order of arrival and are routed to the first available agent within each department.

Queensland pulls in net options

By Peter Young

BRISBANE — The 35 companies that indicated interest in taking over Queensland's $13 million Q-Net have been whittled down to six or seven.

That is the number of invitations understood to have been sent out by the government to a shortlisted group of 11 bidders selected in mid-June.

The letters from the government contained questions designed to permit a better comparison of the various offers. They also contained invitations to a formal interview combined with a presentation.

Short-listed bids reportedly include those from Telecom, British Aerospace, McConnell Dowell Nichols and media tycoon Kerry Stokes.

Perhaps surprisingly, the government did not receive any bid from the Bond Media group.

Industry Development Minister Peter McKechnie called the standard of proposals "impressive" but declined to reveal the dollar amounts being bid.

Speculation covers the range from zero to near the $13 million McKechnie has pegged as the price it cost to set up and maintain Q-Net.

McKechnie said bids were being evaluated not only on price but the range and quality of services being proposed as well as the size of equity being offered to government.

Civil servants are being aided in the selection process by independent accounting consultants Price Waterhouse.

A spokesman for McKechnie said the process "would not be rushed" and indicated no decision was likely to be announced for at least two months.

INSIDE

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A close look at the technology and its effect in Australia — pages 15-18

E-mail fights off a new force in fax
Can traditional intercompany communications methods compete? — page 13-14

War heats up for net management
Australian company takes IBM head on — and looks like winning! — page 6

Diskless PCs take users by storm
Cost and security benefits find ready acceptance in network base — page 19

Plessey's $A350m defence job

MEADOWBANK, NSW — A $A350 million contract for the production of an advanced battlefield communications system for Australia's armed forces has been awarded to Plessey (Australia).

The so-called Raven project has been developed in Australia by Plessey in cooperation with its UK parent. It incorporates tactical communication systems with state of the art technology to prevent eavesdropping or jamming during field operations. It is designed to perform in a variety of harsh climatic and electronic conditions, yet to provide user friendly operations for soldiers in the field.

All equipment, including computerised battlefield service and repair facilities, is being field tested by the Australian Defence Forces.

Plessey will now begin production of about 2000 HF and 3900 VHF radios as well as associated ancillary and frequency management systems.

Edwin Matiuk, managing director of Plessey (Australia), said the government's decision to proceed with the Raven project would have considerable implications for exports. "With this as a base, Plessey will be able to manufacture state of the art defence systems for friendly nations throughout the Pacific," Matiuk said.

To enhance Raven's development, Plessey had encouraged the manufacture of Australian produced high technology components, many of which were now being evaluated for suitability in like projects overseas.

Ericsson wins $A26m contract

MELBOURNE — Telecom has continued its progress towards the provision of its integrated services digital network (ISDN) by awarding a $A26 million equipment contract to Ericsson.

A spokesman said the contract is for the provision of switching equipment and will see the gearing up of Ericsson's AXE telephone system for ISDN.

Telecom plans to launch the network commercially next year following trials by selected major customers. The initial network will consist of eight AXE digital central processor switches in all major capital cities. Initially there will be two in Sydney and Melbourne and one in Canberra, followed by one each in Brisbane, Adelaide and Perth.

Two R&D model exchanges will also be provided by Ericsson.

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NES2FPC

Network News

Late news breaking from the daily IDG News Service

NEW YORK — Timeplex Inc has moved to bolster its sizeable share of the multiplexer market with the introduction of a high capacity T-1 multiplexer and a network management system said to be an implementation of a new networking architecture called Systems Connectivity Architecture (SCA). The Link/100 nonblocking multiplexer is claimed to handle up to 144 T-1 links and 15,000 I/O channels at a single node. It allows users to select destinations by entering mnemonic addresses, and allows any terminal to communicate with any other compatible terminal or host. The architecture of the network management product, Time/View, is said to provide for both hierarchical and regional management of various network nodes. It includes a bridge to IBM's Netview/PC. Timeplex Australia Pty Ltd is at 275 Alfred St, N Sydney 2060. Tel: (02) 957 1660.

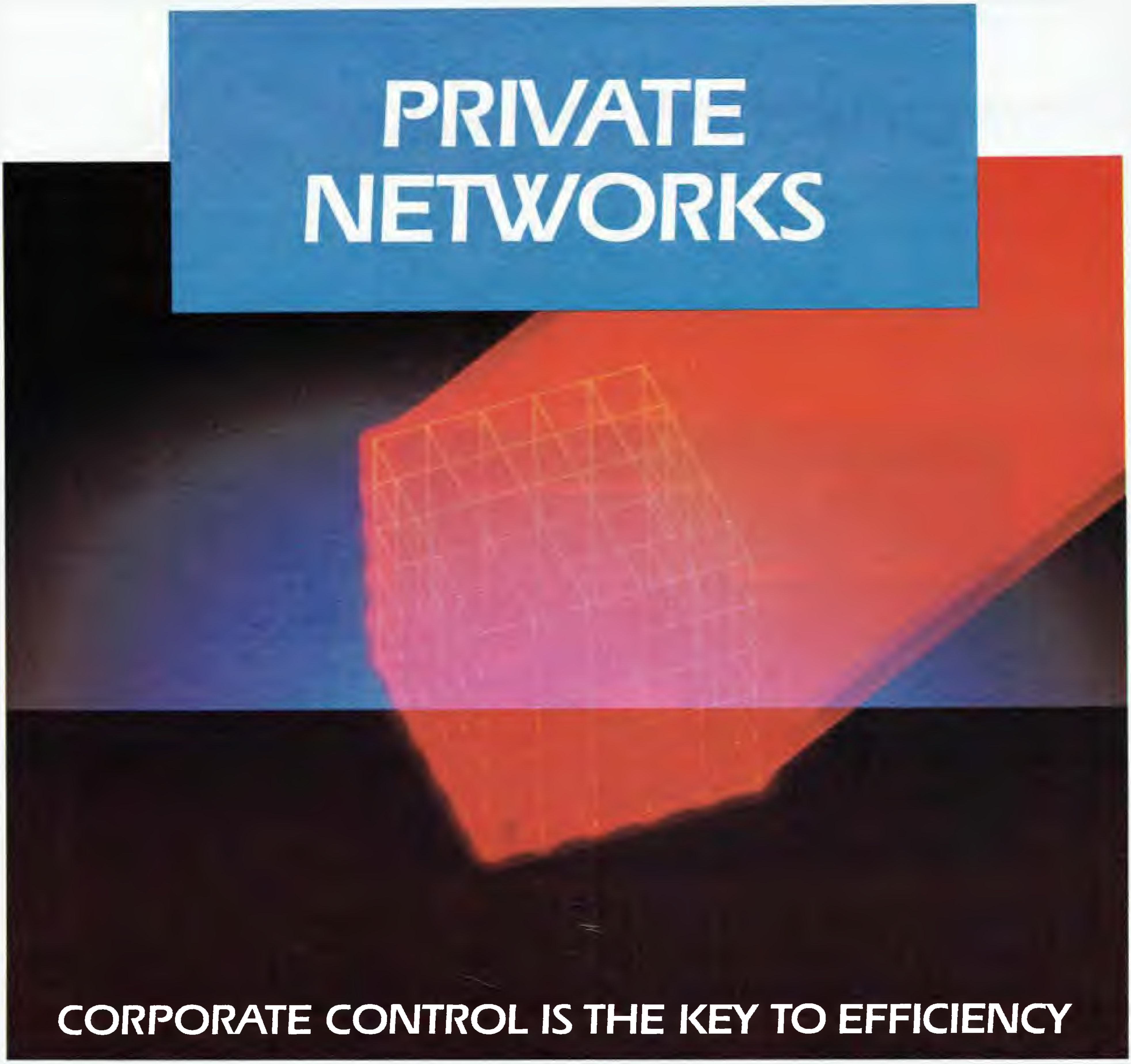
SAN JOSE, California — Excelan Inc has signed a letter of intent to purchase Kinetics Inc, a developer of networking products such as Appletalk for Macintosh personal computers. The purchase, worth about $US7.6 million, could hoist Excelan into the list of the top four vendors in the Apple networking market beside 3Com, Apple and Corvus. It would also boost Ethernet as the leading technology for linking Appletalk users with networks and computers from other vendors.

TOKYO — The International Standards Organisation (ISO) has issued a draft international standard for managing and monitoring network services. Although the overall standard is set, the ISO must hold future meetings to discuss and approve each part of it, including defining port management and the threshold for network errors. OSI network management has become an important issue for the ISO because of user concerns about the reliability, availability and security of OSI networks.

ARMONK — IBM has begun shipping the 3270 Connection emulation board for the PS/2 and 3270 Workstation Program. The 3270 Connection plugs into one slot of a Model 50 or 60 and communicates with a mainframe via an IBM 3174 or 3274 cluster controller over coaxial cable. It will also communicate with the 9370 computers through the 9370 Workstation Subsystem Controller.

SAN FRANCISCO — Comshare has released software that allows PC users to automatically retrieve files from a mainframe and display data in a variety of formats. The Commander Executive, which runs on an IBM PC AT or compatible with an EGA board, automatically accesses files from a mainframe, a PC or an electronic service. Users can create compound documents that include spreadsheets, graphs and illustrations. Comshare Inc is at 3001 S State St, PO Box 1588 Ann Arbor, MI 48106. Tel: US (313) 994 4800.

BRUSSELLS — The executive Commission of the European Community has proposed moves to deregulate Europe's telecommunications markets. Officials said that the European industry needs to boost its performance in order to maintain its competitiveness in world markets. The EC's blueprint calls for curbs on the power of Europe's State controlled telecommunications authorities, liberalisation of member States' procurement policies, and the creation of a body to draw up common standards for communications.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Slow growth in Lan market

NORTH SYDNEY — Growth of the installed base of local area networks (Lans) in Australia has been so slow that it stands in marked contrast to the booming US market, which is currently growing at about 60 per cent a year.

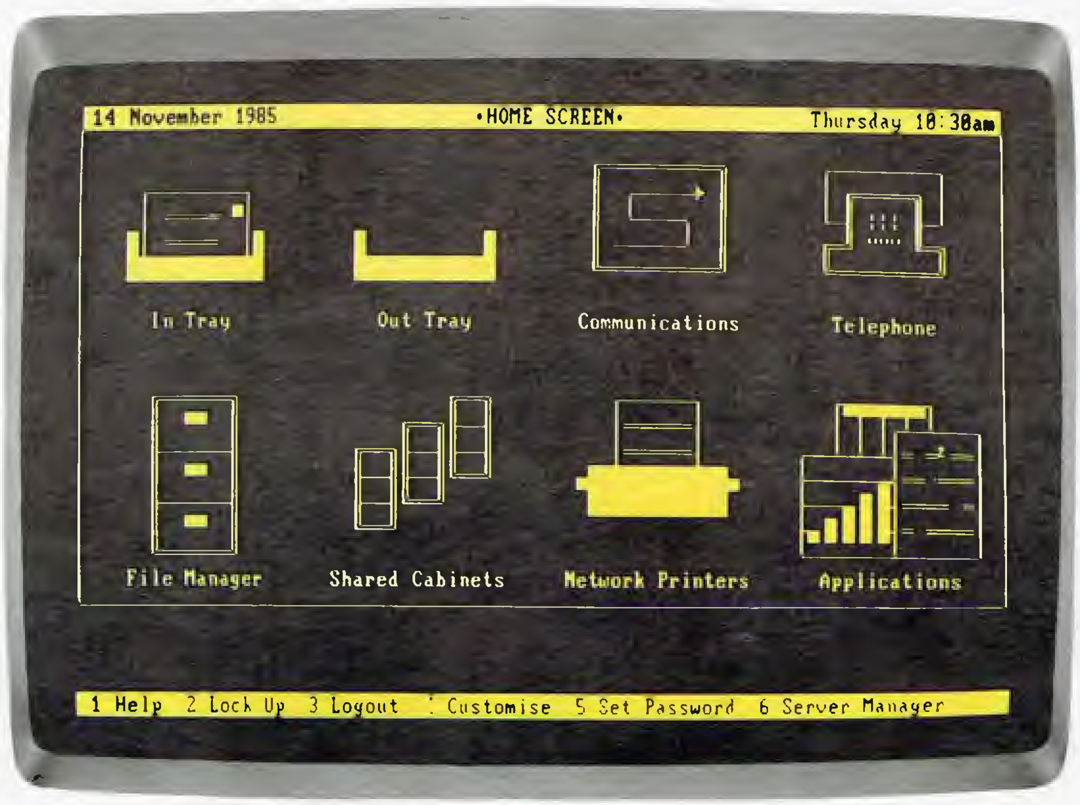
A survey conducted by Compass Research predicted better growth in the next 18 months, with a dramatic turnaround once IBM begins installing its Token Ring Network within its large user base in Australia. "The carry-over effect this will have on the total Lan market will be felt in 1988, by which time total Lan revenues will have risen to $A164 million, more than double the 1986 level of $A65 million", Compass' Lans Report noted.

The report identified as the major current impediment to growth the great difficulty in justifying communications capabilities on PCs, as the attachments often cost more than the machines themselves. "While the connect cost remains high, many organisations will not be able to justify the implementation of a Lan", the report stated.

Other problems that make potential users think twice about installing a Lan are:

- ■ Lack of assurance about Lan vendors' claims for their products' network compatibility.
- ■ The impending announcement of IBM's complete Token Ring Network strategy. The report notes that IBM's dominance in the PC and mainframe markets puts it in a position to set de facto industry standards, and many organisations that use IBM equipment appear to be waiting for complete Token Ring announcements.

Compass Research is at 99 Mount St, N Sydney 2060. Tel: (02) 957 1377. Fax: (02) 959 3914.



Makes using your PC network as easy as looking at pictures

You're looking at Tapestry – the network office automation software to run and manage your PC network. The pictures, or "icons", let you instantly select and access any number of hard disks or printers in your office. Servers aren't dedicated in Tapestry, so all your PCs are always free for use as workstations. And any workstation, subject to your nominated security, can select from the whole menu of icons. For example, each hard disk on the network is presented to the user as a file cabinet icon. Within each cabinet are drawers of icons. The drawers contain your files, set up according to the way your company or department works. It's as easy as looking at pictures. And in the same pictorial way you can choose a printer (anywhere in your office), send electronic mail, send telexes, even access your Tapestry network from outside using a PC with modem and ordinary phone lines.

Tapestry runs with all the major types of LAN hardware, completely replacing other network operating software. Among supported hardware types are: IBM Token-Ring, Novell, 3Com EtherLink and Ungermann-Bass Net/One.

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☐ *USERS take heart, someone out there in vendor land is beginning to understand some of your problems. When Bernard Guidon, Hewlett-Packard's international marketing manager for the information networks group, recently visited this country to help announce Advancenet he acknowledged the problems managers face in making technical purchasing decisions. "When a networking decision is made by a technical guru, the businessman doesn't always get the decision he needs", Guidon admitted.*

Communicate clearly

☐ *THOSE Telecom people certainly have a way with words, although not necessarily a flair. Dennis Hambleton, who has become expert in Telecom-Speak after 20 years with the commission, recently addressed a Yankee Group seminar on the subject of Telecom's interconnect and tariff policies. "There are two categories", Hambleton explained. "They are the basic and the non-basic. Basically, the non-basic rate is everything that's not basic rate".*

Never clone alone

☐ *THE latest words on Novell's efforts to port Advanced Netware to the Intel 80386 operating environment are complicated, but they go something like this: Novell is building an environment consisting of Advanced Netware/386 integrated with PC-Mos from The Software Link and Desqview, an environment that is compatible with Microsoft's Windows, but which is produced by Quarterdeck Office Systems. Novell also intends to graft Softcraft's Btrieve and IBM gateways from CXI into Netware. The result — network and 386 operating systems with builtin connectivity and database support — should sound familiar to fans of IBM's OS/2 and OS/Extended.*

Nets at night

☐ *WHAT does go on in some of those big DP sites at night? When announcing Version 2.0 of the Net/Master network management system for IBM mainframes, John Robinson, managing director of Software Developments, made reference to the system's operation in "lights out mode". He did not elaborate to an expectant audience.*

Missing link causes hi-jinks

☐ *ANALYSTS at a recent consultants' meeting with IBM were excited when they discovered the company had left some key documents out of the latest issue of its SNA Reference Summary, which documents SNA protocols. Missing was IBM's Format Identification 4 format (Fid4), which details the transmission header needed to route data through an SNA network. Since Fid4 had been included in previous SNA references, the analysts reasoned that IBM had excluded Fid4 to make life tough for competitive frontend vendors who need formal documentation to design their products. But their imaginative theories were demolished when IBM personnel admitted they had just reworked the documentation — probably making it more difficult to use than ever, the analysts mused.*

Renison instals X.25 network

SYDNEY — Renison Goldfields Consolidated has upgraded its Australia-wide data communications facilities with the installation of a private X.25 network in place of Austpac.

The company's network links five major operations in WA with its Prime 9955 II minicomputer in Sydney. The move to a private network was made to attain a more "robust" link between Sydney and WA and to handle increased traffic volumes.

Four of Renison's mining and mineral processing operations located near Bunbury and Geraldton, as well as the Perth administration office, rely on the network for online data entry, enquiry and reporting facilities.

Austpac links are now used for backup services only at each of these locations, but the public service still provides connections to other Renison sites. These additional sites use either Prime computers or Micom packet assembler/disassemblers (Pads).

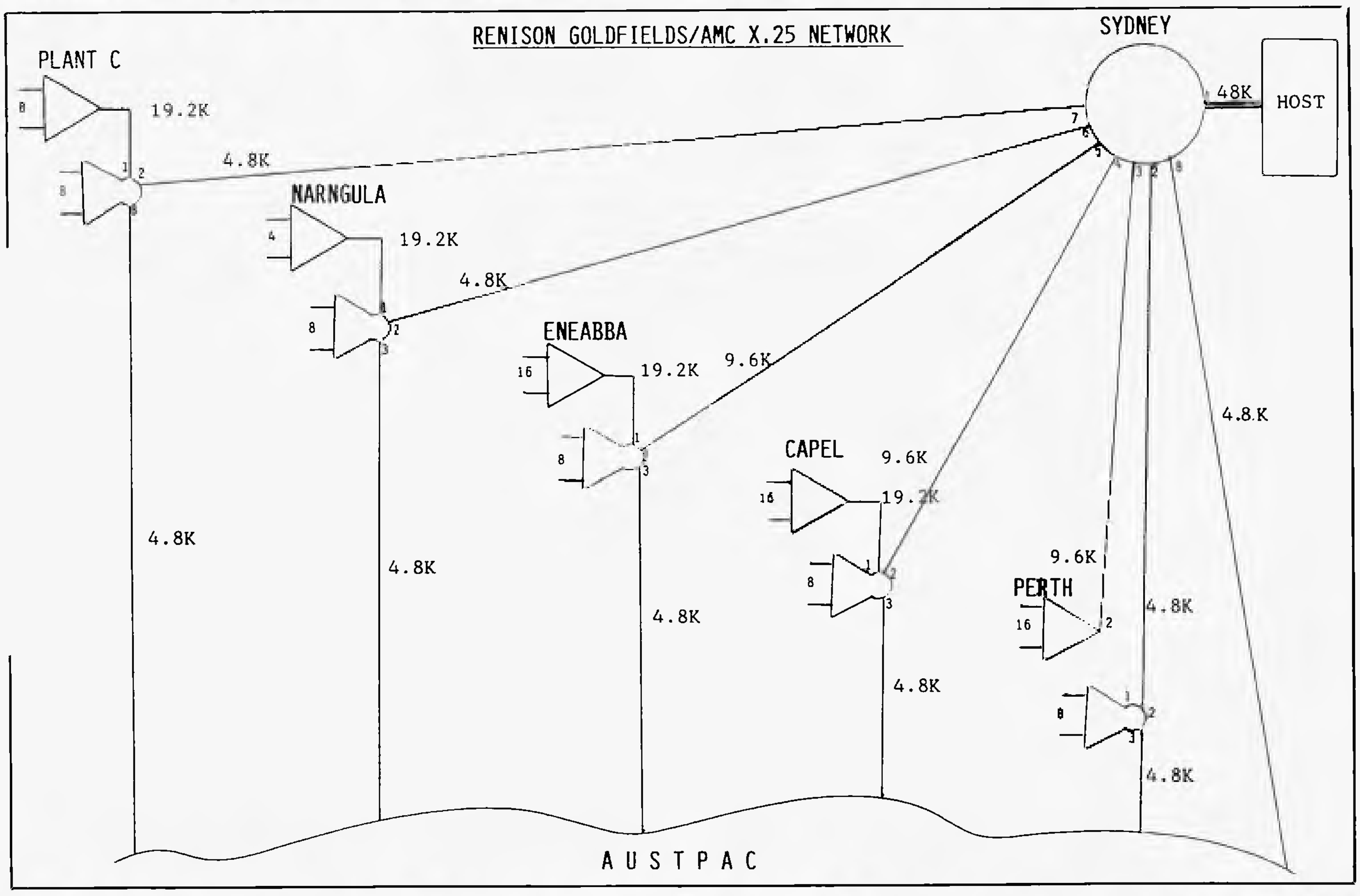
The network was expanded with PCI Smartnet equipment supplied by Datacraft. The X.25 PCI Pads and switches provide asynchronous to X.25 protocol conversion, line concentration and call routing.

The system that was developed had to be configured to allow:

- ■ Logical access to the Prime host for all users;
- ■ Automatic backup via Austpac in the event of a Telecom link failure;
- ■ Tracing and identification by the host computer of the network address of each user accessing the host;
- ■ Access via Austpac to services located elsewhere on the public data network; and
- ■ Access to configuration control and network management services from the Prime host or by any authorised user connected to the network.

In addition the system had to allow for interworking with Prime and Austpac addressing schemes while conforming to CCITT and other international standards.

"Datacraft achieved this by utilising the flexible Smartnet address identification and address masking systems to implement a logical hierarchical addressing scheme," a spokesman explained. "This allows each network entity to be individually addressed, yet recognised globally, regardless of whether the entity be part of the private or public network."



Company formed to develop QPSX

PERTH — A $A10 million company has been formed to develop a Queued Packet Synchronous Exchange (QPSX) communications system.

The company, known as QPSX Communications Pty Ltd, is a joint venture between Telecom and the University of Western Australia, where the QPSX was developed. It will carry out pre-production work and conduct field trials in Perth.

Associate Professor John Hullett, leader of the research team, said the QPSX will speed up the movement of existing information forms, such as computer data and facsimile, and will also enable the swift transfer of data that until now had usually been too costly for telecommunications, such as pictures, manufacturing diagrams and plans.

Hullett explained that the technology uses a single network to transmit voice and all forms of data, rather than four separate networks as at present. He claimed the method will be cheaper, more efficient, and easier to maintain.

The research program was launched three years ago and has been supported by grants worth $A250,000 and by staff seconded from Telecom, which will now provide $A6.1 million for the final phases of the development program. Field trials of the new system are to begin early next year, and commercial distribution is planned for 1989.

The first commercial product from QPSX Communications Pty Ltd will be a metropolitan area network (Man), which will introduce a range of services not currently provided on a cost effective basis. These include very high speed communications between computers, rapid picture transfer associated with automated manufacturing techniques, and medical diagnosis and imaging. Man will also provide access to Telecom's ISDN.

The company has a staff of 19, which will be increased to 25 within the next six months. It will be independent of both the university and Telecom.

A spokesman said the QPSX concept could earn $A150 million a year in exports.

Advanced access system

FRENCHS FOREST, NSW — An advanced computer access security system has been released by Case Communications.

A spokesman said the Horatius system attaches between the host computer and the communications network, providing user identification validation prior to enabling connection between the user terminal and the computer system.

Horatius operates with both asynchronous and synchronous communication systems and is transparent to all valid user data, the spokesman claimed.

It offers three levels of security from simple password and timed access windows, to split line dial back and Challenge hand held identification.

In a system with fixed sites, Horatius dial back provides a deterrent barrier to outside intruders, the spokesman said.

Horatius is said to operate with any modems using the Hayes compatible auto dial data strings.

Case is at 10 Rodborough Rd, Frenchs Forest, NSW 2086. Tel: (02) 451 6655.

NT determined to develop its private net

By Peter Young

DARWIN — The Northern Territory is more determined than ever to set up its NT Net private communications system in the wake of Telecom's push for increased charges.

"The earlier something is in place, the quicker savings can be made," one government source said.

Disenchanted with earlier Telecom proposals to operate the network, the government seems in no mood to re-open detailed discussions with the public utility.

Instead it has been holding talks with McConnell Dowell and Nichols that have generated "some realistic common ground", according to one insider.

"They are of a strong conviction to go ahead in a way we agree is a sensible one and they are now refining their next action."

A government official said that should not be interpreted as meaning the field of possible operators had been narrowed to one.

The NT government is aiming at a network linking 135 locations around the territory.

Export orders for Saturn 20

LANE COVE, NSW — Scitec Communications Systems has won two substantial export orders for its Saturn 20, 2M-bit/sec long range digital modem.

The larger order for 200 units was placed by Koorcom, the communications division of the Israeli giant, Koor Corporation. The 200 Saturn 20s, worth $US600,000, are expected to be used by the Israeli government communications authority.

A Scitec spokesman said the Koorcom order came as a result of marketing activities undertaken by Scitec's US office.

The second order for 40 units was placed by Teleinform Ag in Switzerland. These units are being used by Swissair, Credite Suisse and a number of other large Swiss corporations.

PC links for DEC's Vax

CHATSWOOD, NSW — A package that allows users of IBM personal computers and compatible machines to communicate with DEC Vax, Microvax and Vaxmate computers is to be released by Digital Equipment Corporation (Australia) Pty Ltd in October.

A spokeswoman for DEC said the IBM PC Network Integration Package allows users of IBM's PC, PC-XT and PC-AT to participate in Lans using Vax/VMS Services for MS-Dos software.

Vax/VMS Services for MS-Dos allows Vax, Microvax and Vaxmate computers to act as application, data and resource servers to groups of Vaxmate and IBM personal computers, the spokeswoman explained. Personal computers can then use the servers to share applications, data and resources; access information from remote systems on the network; and apply that information to industry standard applications.

The package is available in two configurations, which offer the same networking functionality. They differ in that one is offered with DEC's mouse, dual mode LK250 keyboard, and support for MS-Windows and VT220 terminal emulator.

The full package costs about $A2270, while the Network Services Package costs about $A1660.

The package was announced in September, 1986, and DEC had expected to begin shipments during the first quarter of 1987. However, the program's testing and evaluation cycle lasted longer than expected, according to a US company spokesman.

One source close to the company said the delay had occurred as DEC figured a way around the incompatibilities between Decnet drivers and Ethernet compatible boards.

Battle for the network systems market

A big range from IBM

IDG News Service

CHICAGO — IBM has announced a sweeping range of products that are designed to shore up communications capabilities across its diverse product lines and which, company representatives boasted, incorporate 500,000 lines of new software code.

Although the releases included the long awaited enhanced version of the Netview network management system, central to the announcements and to IBM's communications strategy is network connectivity via the company's 13-year-old Systems Network Architecture.

Nonetheless, the company is also acknowledging the strength of other vendor's equipment in the communications market, and the announcements presented several scenarios that allow customers to incorporate outside equipment via IBM connectivity solutions.

For instance, the company announced that two enhanced versions of its Advanced Communications Function/Virtual Telecommunications Access Method (ACF/Vtam) — IBM's strategic software for the System/370 — will offer peer-to-peer communications across SNA without host applications assistance.

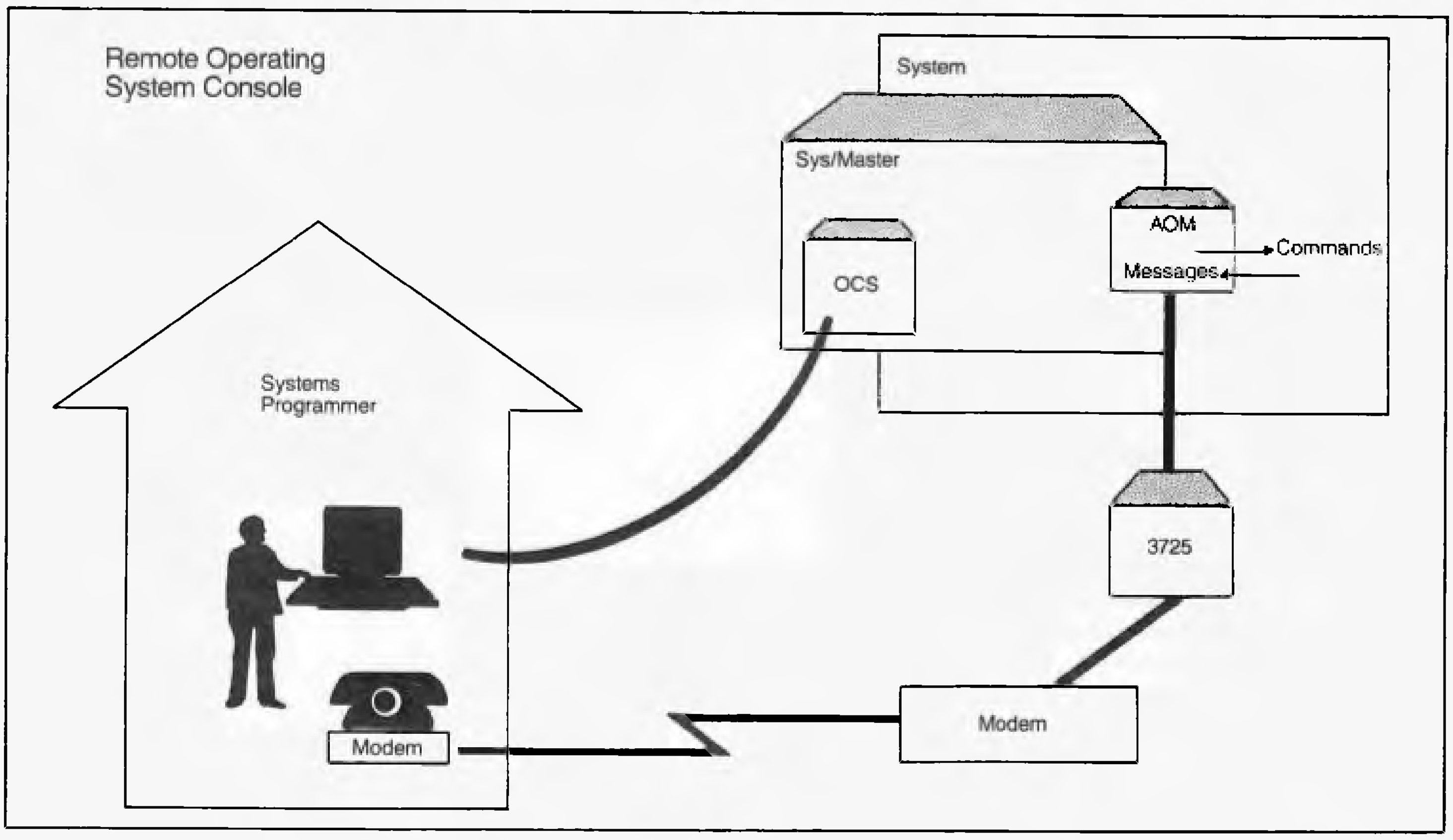
The enhancements should enable users to manage and connect applications running under System/370 to applications running under other operating systems, including the System/36, /38 and other manufacturers' equipment.

IBM also announced Netview Release 2 which is said to enable customers to set up a single control centre to manage the operation of SNA and non-SNA networks. It also reportedly lets users control the operation of local and remote System/370 mainframes. Scheduled for release in December, Release 2 will allow customers to run Netview unattended and distributed in VM or VSE environments.

The announcements also included enhancements to IBM's 9370 information system in four areas: network connectivity, network management, network installation and device support. The enhancements should allow customers to build, replicate and operate multiple 9370 installations more easily.

The 9370 portion of the announcements has been anticipated for months, in the light of customer criticism of the machine's capabilities.

IBM's enhanced ACF/Vtam, APPC support and Netview Release 2 all provide expanded communications and ease of installation capabilities for the 9370. Additionally, the company announced X.25 support on the 9370 Telecommunications Subsystem Controller for Transmission Control Protocol/Internet Protocol (TCP/IP).



Security in Sys/Master is based on user identification. Therefore, a Sys/Master operator with Master console authority can log on at any terminal in the network and have a full function master console.

Product tackles complex tasks

CHATSWOOD, NSW — Australian company Software Developments has announced a major product that can be packaged with its Net/Master mainframe networking tool to produce what the company describes as Advanced System Management.

The product, known as Sys/Master, has been developed to address the increasingly complex and expensive task of managing mainframe operations from anywhere in the computer network, a spokesman said. It automates responses to operator messages issued by the MVS/XA or SP operating system, helping to alleviate the increasing MVS message volumes. Such message auditing and management done at machine speeds frees operators for higher level work and offers immediate benefits to advanced IBM mainframe users, the spokesman claimed.

When Sys/Master and Net/Master work together as Advanced System Management they provide both operations control and network management. The spokesman said some of the capabilities of Advanced System Management included operational control of single or multiple machines in the same or distributed sites; automation of operations procedures; 24 hour operation; high speed performance; comprehensive presentation of status information and security that applies to personnel rather than to terminals, the spokesman claimed.

The system effectively has an expert system capability that allows it to make decisions on the appropriate action to take when prompted by a message. The spokesman claimed this capability alleviates productivity bottlenecks that are typical in large systems.

He added that Advanced System Management has been tested at rates greater than 700 messages per second.

Since there is a common base component between the two components of Advanced Systems Management, current Net/Master users are effectively given a discount if obtaining the additional Sys/Master licence. Prices for existing Net/Master users start at $A710 a month, or $A28,670 for a permanent licence. For new customers the charges for a basic system start at $A1002 a month, or at $A39,686 for a permanent licence.

The Sys/Master component has been installed by Westpac, which also runs Version 2.0 of Net/Master (*Communications World,* June, p1), and US marketing by Cincom Systems is expected to start this month.

By contrast, IBM's Netview Release 2, which contains system management enhancements, is not expected to be available until December.

Correction

Contrary to a statement in our last issue (*Communications World,* June, p1), IBM's Netview has been available in Australia since its announcement early in the year. We apologise for the incorrect interpretation we put on the statement IBM gave us before preparation of that article.

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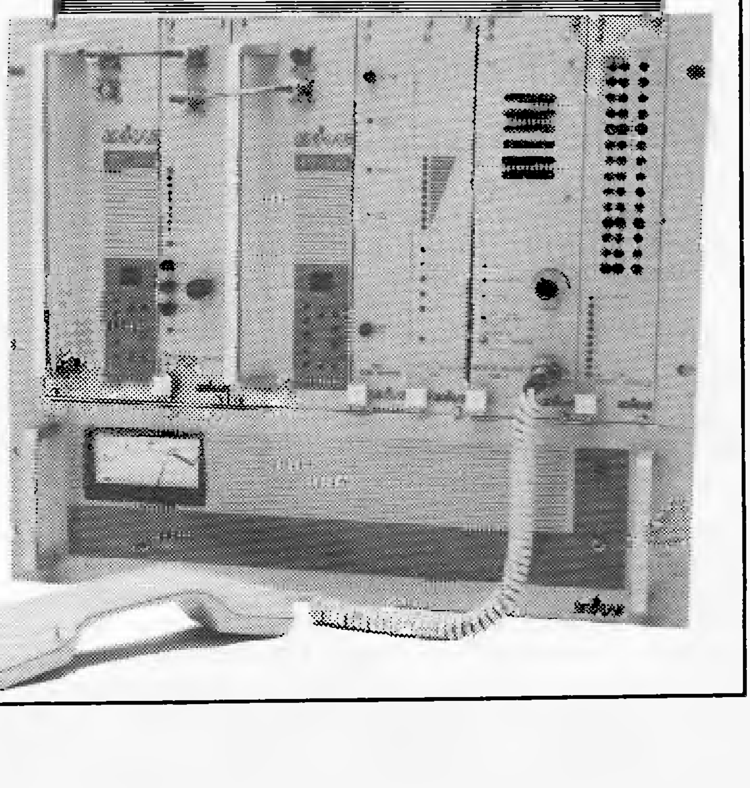

Telememo, Minerva to merge in new service

SYDNEY — Telecom and OTC have joined forces to provide an electronic messaging system known as Keylink. The new service will be formed by a merger of Telecom's Telememo and OTC's Minerva services, which will cease to exist from August 1.

An OTC spokeswoman said Keylink will provide an integrated national and international electronic mailbox service and will give improved national and international telex facilities and a larger user base than the two existing services.

The service has a completely new charging system, which is under consideration by the minister. It involves a minimum monthly charge of $A33 per mailbox for business users with up to nine boxes, and runs at $A300 a month for large corporate accounts with 10 or more mailboxes. A telex option costs $A30 a month for each mailbox.

Other charges, which depend on the time of day, include online connection charges of between 15 and 20 cents; usage charges of one or two cents per thousand characters; storage of one cent per two thousand characters per day; and charges for domestic telexes of 30 or 40 cents.

Users entering the system via OTC's Midas will incur an additional charge of 42 cents a minute.

Enquiries should be addressed to Keylink, which has its headquarters on the fourth floor, BNZ House, 333 George St, Sydney 2000. Tel: (02) 261 7999. Fax: (02) 261 7910.

KEYLINK PRICE LIST

(As at 1st August 1987)

SERVICE OPTIONS	BUSINESS ACCOUNT (PER MAIL BOX FOR 1 TO 9 MAILBOXES)	CORPORATE ACCOUNT (10 OR MORE MAILBOXES)
Registration and Starter Kit * once only	$25.00	$200.00
Minimum Charges * per month	$33.00	$300.00
Premium Telex Option * per month	$30.00 (per mailbox)	$30.00 (per mailbox)

BASIC USAGE CHARGES	7am – 6pm (EST) MONDAY TO FRIDAY	ALL OTHER TIMES
On-Line Connect charges (per minute)	$0.20	$0.15
Usage (per kilocharacter)	$0.02	$0.01
Storage (per 2 kilocharacters per day)	$0.01	$0.01
Sending National Telex (Standard and Premium) per minute	$0.40	$0.30
Sending International Telex (Standard and Premium) per minute	Standard International Rates	Standard International Rates

ADDITIONAL CHARGES FOR INTERNATIONAL AND OTHER FACILITIES	
International Electronic Mail and Data Base Access	
Network Access charge per minute	$0.13
Network Usage (per kilocharacter)	$0.50
Other facilites	
EPUB (Electronic Publishing) per minute	$0.10
File Transfer per minute	$0.10

Join the club — at a price

By Luis Huesch

MELBOURNE — Telecom says it will launch a dedicated facsimile network Faxstream later this month, offering specially conditioned lines to corporate users who may wish to switch over from the PSTN — for a price premium.

Industry watchers see the move as a belated attempt to capture and "condition" at least part of the burgeoning fax market before the advent of ISDN next year and the Group 4 fax with its virtually instant, error-free transmission.

Faxstream will be marketed, at least initially, to high-volume business users, who may be able to justify the extra cost in line rentals of perhaps $A600 a year, a "flagfall" fee for each fax sent, plus distance-dependent charges.

The prospective "members" of what would amount to a closed user group will reap the benefits of going through all-digital exchanges and specially conditioned lines that let fax machines "talk" to each other at their top data rate of 9600 bits/sec.

On the normal public switched telephone network (PSTN), still mostly analogue and designed to carry voice traffic, fax machines sometimes have to throttle back to as little as 2400 bits/sec to cope with line conditions.

Line noise can also cause scanning errors that can force receiving machines to send a "please retransmit" message to the sending machine, further slowing transmission. The cost penalties incurred can be quite drastic.

With its scheme Telecom is obviously trying to correct a strategic oversight: having failed to foresee the massive facsimile boom, it has little hope now of forcing the existing user base on to a special network, as has been done by other PTTs less weakened by deregulatory pressures.

Details of the fax net plan were worked out by Telecom's business services department, which only recently surprised fax vendors with an offer to act as an agent/reseller of facsimile machines.

Manager Paul Smyth said Telecom was pleased with the business propositions it had received from about 12 vendors, and a decision would be made "in the next couple of weeks" on whose machines would be taken aboard.

Whatever the outcome, most vendors have little reason to be pleased with Telecom: they have been badly "stung".

According to one player, Telecom — apparently using the mini-budget excuse — has hiked the current once-only approval fee of $A800 per fax machine tested to $A5000 a model.

But that is not the worst of it — the fee must now be paid *each year* for each model. Cynics might regard a potential levy of $A50,000 a year for a 10-model distributor such as Delairco as a strong inducement to go with Telecom as a reseller.

PC fax card on the market

SURREY HILLS, Vic — A PC fax card for IBM or compatible personal computers has been released in Australia by Telecost Pty Ltd.

A spokesman said the Fax-Mail card operates in background mode on the personal computer and enables computer users to transmit documents from the device on which they were created.

"The Fax-Mail offering can be configured to transmit and receive documents automatically," the spokesman noted. "It supports an automatic dialling directory and will allow personal computers to store, edit and forward facsimile documents. The package will also support multiple message and multiple site document delivery," he added.

The Fax-Mail 24 and 48 boards transmit and receive documents at 2400 and 4800 bits/sec respectively and can work with Group III fax machines. A third offering, the Fax-Mail 96, runs at 9600 bits/sec and works with Group III (digital) and Group II (analogue) fax machines.

Prices for the boards start at about $A800.

Telecost Pty Ltd is at 486-490 Whitehorse Rd, Surrey Hills, Vic 3127. Tel: (03) 836 0322. Fax: (03) 836 8955.

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PS/2 OPERATING SYSTEM ALTERNATIVES

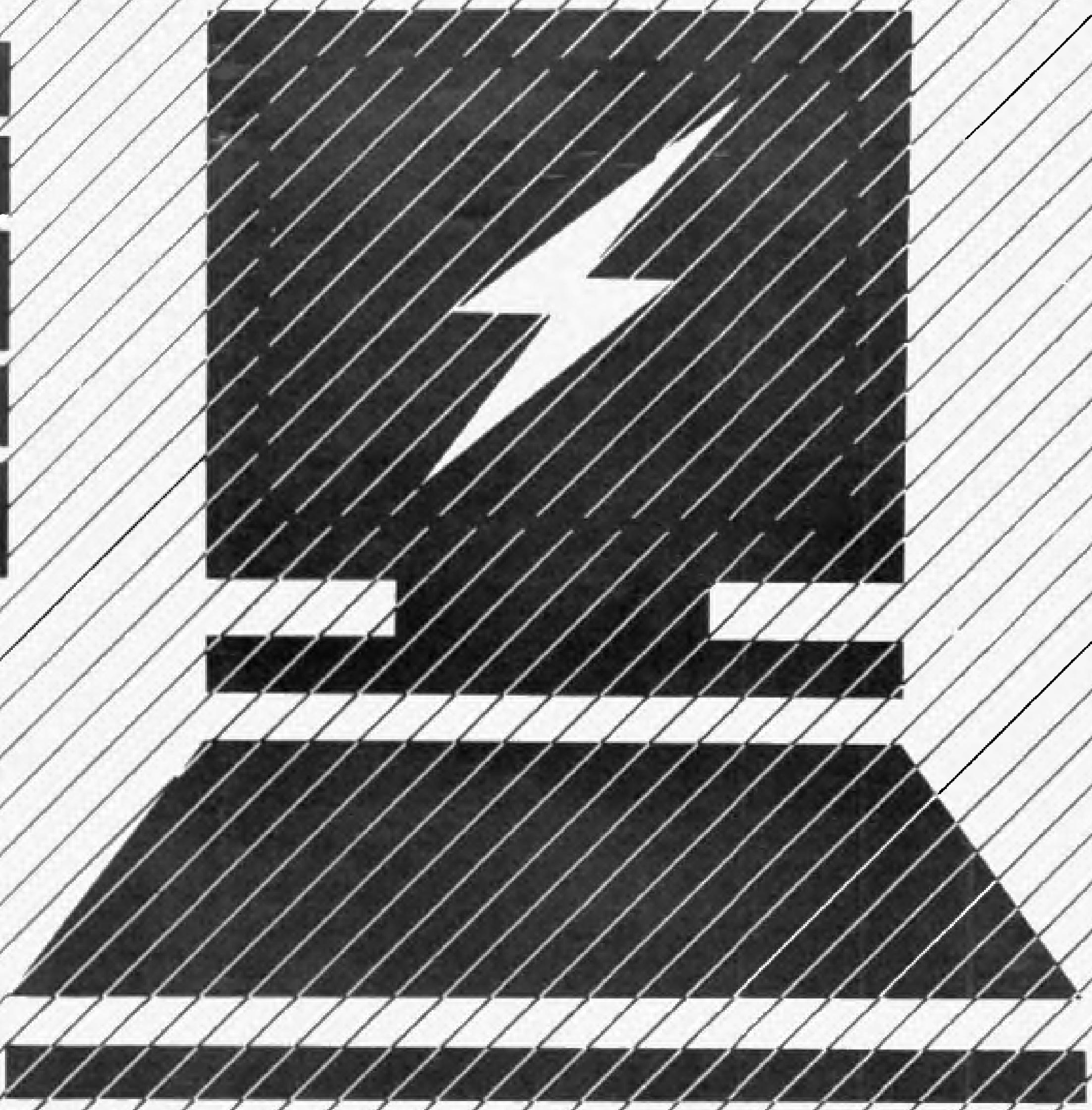
The three sessions in this group will be heavily attended — Register early to ensure your seat.

OSA-1 Microsoft's OS/2: Generic and IBM-Proprietary

Microsoft's finest programmers continue to burn the midnight oil in an all-out effort to meet delivery commitments in first half 1988 for the operating system that will unleash the full expanded memory power of 286 and 386-based machines. Much of this extraordinary development project involves "tightening" of the code for this new OS, presently estimated in excess of 1 million bytes! A further complication is provided by the requirement to build into the IBM version certain proprietary "extensions" for communications and graphics. Can Microsoft win its race against time, in the face of mounting anxieties (and frustrations) on the part of users and vendors? Our COMDEX panelists are cautiously optimistic!

Panelists:
Andrew Larkin — Microsoft
Jim Monaghan — ACI Computer Services
Tony Rogers — Space-Time Research
Brenton Vettoretti — Digital Matrix
And an IBM Speaker

OSA-2 Unix Advocates See "Window of Opportunity"
OSA-3 Pick Popularity on Rise



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Pentagon chooses OSI standard

By Elisabeth Horwitt

FRAMINGHAM, Mass — The Unix community — a group of stubborn and opinionated techie types if ever there was one — has been thumbing its nose at the slowly progressing Open Systems Interconnect (OSI) networking standard, preferring to stick with the tried-and-true Transmission Control Protocol/Internet Protocol (TCP/IP). Right now, this seems justified.

After all, TCP/IP networking protocols have been around a long time, enjoying the support of the US Department of Defence, a mighty contractor. And in the past year, third-party networking vendors such as Ungermann-Bass, Excelan, and Micom-Interlan, have been introducing a veritable slew of TCP/IP products that network not only Unix systems but also everything from IBM Personal Computers to Digital Equipment Corp Vax minicomputers.

In contrast, the OSI standards effort seems to be awash in duelling vendors, thwarted by the need to address a bewildering array of industry-specific communications needs. "OSI is a model on which you can hang a dismayingly large number of protocols," says Alan Nemeth, president of the Usenix Association, a Unix users group.

At the recent Usenix annual summer conference in Phoenix, TCP/IP was clearly the networking protocol of choice. Even IBM was promoting TCP/IP, albeit primarily as a way to link its Unix-based RT Personal Computer. Few, if any, OSI products appeared on the exhibit floor.

However, this state of affairs may change. The Defence Department has announced its intention to standardise on OSI instead of TCP/IP. And while the OSI standards bodies have pretty much agreed on a distributed file system, the Unix community is still debating the relative merits of at least three such systems: AT&T's Remote File System (RFS), Sun Microsystems' Network File System (NFS) and OSI Ftam.

A distributed file system is a crucial element of most networks, but despite its strong backing among users and vendors, there is no guarantee that NFS will become the distributed file system for Unix. AT&T nominally supports NFS but is selling RFS hard as the best networking system for Unix-only installations. AT&T and Sun agreed to merge — or at least integrate — NFS and RFS but have announced no results so far.

Meanwhile, the major Unix standards effort, Posix, is staying away from the whole networking issue, although X/Open, another Unix standards effort that supports Posix, is said to have a networking subcommittee.

All the signs point to peaceful coexistence rather than amalgamation for NFS and RFS — at least for the moment.

Since RFS and NFS address different user needs, Unix techies — who can do a little programming to interconnect the disparate systems — may be content without a standardised distributed file system. However, vendors that must connect to the non-Unix world or that do business with the US government may find themselves being edged slowly toward OSI. NFS in particular, which currently links a broad range of computers, may eventually give way to OSI's Ftam as the multivendor file system of choice.

Telecom's fourth DPS 90

SYDNEY — Telecom has signed up for its fourth DPS 90 large scale mainframe from Honeywell Bull, giving the computer supplier its biggest single system order in this country. The triple-processor DPS 90/93 is being installed in Sydney to replace a Quad DPS-8/70 mainframe. It will be used to run various Telecom applications within the Taconet national network environment. The photograph shows Pat Thorncraft and Dave Cook of Telecom with one of the numerous components of the 71 tonne Honeywell Bull system.

Why do they like Disoss?

SYDNEY — The prime reason computer users turn to IBM's Disoss is to improve company-wide communications, both local and remote. Executive support is rated as only the sixth most important of expected benefits after communication, archiving, electronic mail, document retrieval and use of existing equipment.

The ratings were brought to light in a survey of office systems implemented in 64 major IBM sites in North America and Europe. A report detailing the results of the survey conducted by Xephon Technology Transfer, has been released in Australia by Reed Stead Morrell.

The report, Disoss in Practice, notes that implementing Disoss is a long term process with a strong emphasis on planning, senior management involvement and user training and motivation. "Installers look on the product as a critical part of their office automation strategy, even if they are prepared to admit that their strategy is not fixed yet.

"The major problems seem to be in areas such as unfriendly user interfaces, very high hardware resource consumption, and lack of knowledge amongst IBM support people," the report stated.

"History shows that IBM really begins to sort out its products when the opposition start to make inroads to its customer base. However, by its nature Disoss imposes compatibility on the competition and there is no evidence that IBM is being forced to knock the product into shape," it claimed.

Other findings included:

- ■ The overwhelming majority of Disoss users consider Profs to be irrelevant.
- ■ Technical support staff are going to venture reluctantly into the use of the Application Program Interface because of usability and documentation problems.
- ■ Disoss performance has been less than satisfactory.

The report is available for $A108 from Reed Stead Morrell, GPO Box 4723, Sydney 2001. Tel: (02) 29 2165.

Clirs gets WA law reports job

PERTH — Western Australia has given Clirs Ltd the green light to provide WA case law on the national legal information retrieval system.

The agreement covers both the official law reports and unreported judgments of the Supreme Court of Western Australia. The WA database complements the existing primary legal databases of the Commonwealth and other State jurisdictions which are already provided on Clirs.

A spokesman for Clirs said a significant feature of the agreement is the provision of the texts of unreported judgments of the Supreme Court to Clirs in magnetic form. This will facilitate high speed online updating and therefore give rise to the most current case law service in Australia, the spokesman noted.

Westinghouse turns to Australian's firm for help

BALTIMORE — Faced with the problem of linking users to two types of mainframe, Westinghouse Corp has turned for its solution to a company founded by Australian Paul Wood rather than either of the mainframe vendors.

Westinghouse beta tested and then installed the SNA Hub from Wood's US company Netlink Inc. The hub enables Westinghouse users to access both IBM and Unisys mainframes.

"Users from one group needed data from both hosts but did not want to place two terminals on their desks," noted Steve Coppel, a communications analyst with Westinghouse.

The SNA Hub, which was announced in January, supports 15 communications lines, which can each transmit data at speeds up to 64K-bits/sec. The device appears to the IBM host like a terminal controller and supports up to 255 host sessions and also looks like a controller to the Unisys machine. It includes a multiple host routing feature which enables users to link up with a number of different hosts.

Westinghouse plans to expand its use of the SNA Hub from the 50 workers currently attached to the device. "We plan to add to the device a security group that needs access to applications running on a Tandem computer," Coppel explained.

Netlink was established in North Carolina by Paul Wood about four years ago when he became frustrated by the limited opportunities for expansion of his Australian company, Systems Technology. With the growth of Netlink, Systems Technology has become more closely tied to the US company, especially since managing director Richard Buckle moved to a senior position with Netlink in the US early this year (*Communications World,* March, p19).

Westinghouse had been unable to find a product with similar capabilities. Most available products enabled users to move from Unisys to IBM, but were not as flexible when IBM users wanted access to Unisys machines, Coppel noted. The company did find one device that mimicked an IBM 3274 and provided asynchronous capabilities, but it did not function as advertised. Westinghouse agreed to test Netlink's hub on the understanding it would not have to pay if the product did not perform.

Westinghouse received its hub in March and had the product up and running in two or three days. Netlink technicians helped Westinghouse instal the necessary IBM host software, including Job Control Language, run streams and account numbers. Users were connected to the SNA Hub through ports from IBM 3274 controllers and compatible devices.

The hub has functioned smoothly since installation.

ABC's $A4.4 million order

SYDNEY — The Australian Broadcasting Corporation has boosted its computing and data communications capabilities through a $A4.4 million order placed with Digital Equipment Corporation (Australia).

The order includes two Vax 8700 computers and peripherals as well as six new Trans-Lan bridges and Ethernet Lans in the ABC's TV and radio offices in NSW and Victoria. The equipment is expected to boost the corporation's computing capacity by 80 per cent.

One of the new Vax machines will be installed in a new computer room at the ABC's Gore Hill base, while the other will be added to a cluster of two Vax 8650s at the ABC's main computing centre in Sydney.

The corporation currently has a national network linking 450 terminals and approximately 1500 users for more than 14,000 hours a month. A further 220 terminals will be connected.

EDITORIAL

Why haven't satellites taken off?

TEN years on and Australia's satellite age is still waiting to happen. The birds are in the sky and the second stage of the brave new world is about to be announced, but the impact of the technology so enthusiastically forecast 10 years ago has yet to strike home.

While the technology is here and is innovative, as was shown by Aussat's tender for its second generation of craft (Communications World, March, pages 1 and 15), many people targeted as the most likely beneficiaries of satellite technology have yet to feel any benefits. Outback dwellers have little to thank satellites for and, on a system so far exploited almost exclusively by the broadcast industry, mainstream commercial users have little to think about in the way of cost attractiveness.

On top of that, the Australian communications industry has seen little in the way of incentive to be gained from servicing the homegrown satellite boom. A few wiring looms, or designs for antennas that can never be economically manufactured in this country, have been of little help.

Aussat has adopted an innovative approach to its marketplace and has offered services that must be attractive to many large corporations. Yet those same innovative services are not being adopted by those corporations, apart from some esoteric niche markets involving communications with transient field operations.

So why has satellite technology had so little apparent impact on this country?

As Tom Amos notes in his Special Feature article on page 15, the reasons are many and varied. Other industry observers are, however, less optimistic than Amos in their assessment of the technology and the potential Australian market.

There can be no doubt that Australia, with its unique distribution of the bulk of its population in a handful of coastal centres around the continent, offers a latitudinal spread of population that can exploit satellite communications.

But that same concentration of population in just a few centres also means that modern terrestrial communications can offer a more economic solution.

It is perhaps because of this that Telecom's optical fibre highways, though still in the future, offer more cost effective solutions to large corporations than do high priced satellite communications.

Certainly the users have hung back. While the Commonwealth Bank will this month start its pilot tests of Aussat's Starnet system, it seems half-hearted in its efforts. The bank has been enticed into its trials by the fantastic terms offered by Aussat. It remains to be seen whether the bank will adopt Starnet for any of its run-of-the-mill communications.

In effect, the decision about the use of Aussat's communications potential has been made by the users, and the users by and large have decided the price is too high.

The users have set the pace, not the technology or the service. And that is precisely the way users must react in the face of a rapidly evolving technology; they must evolve apace.

Communications is too important to large corporate users for it to be regarded any longer as a "gee whiz" technology that must be adopted simply because it is there.

Australia's satellite technology will continue to grow in the immediate future. But it will not be fuelled by the hopes of politicians or of public servants.

It must be driven by the people who will use the technology. That is the ultimate determinant, and it rests firmly in the hands of the user.

ISDN is the answer, but what are the questions?

By Vincent Bates

THE Question Man was a character on the old Tonight Show. An announcer would give an answer, then Steven Allen would provide the question. If the answer was "He shot down 43 Messerschimitts in 1942," Allen's question would be, "why was Baron von Rufhauser fired from the Luftwaffe?"

Integrated Services Digital Network will be the answer beginning in the late 1980s. Everyone says so: communications industry watchers, the trade press and, above all, vendors. But if ISDN, is the answer, what are the right questions?

For users, there are only two fundamental questions for ISDN: "How can I save my company money?" and "How can my company make money with this?"

Most of the currently discussed capabilities of ISDN are potential answers for the first question only. They offer the promise of more efficient bandwidth management. They promise a more reliable technology and a faster response to user needs. They also offer better network management and control.

This is good, but it is important to understand that the basic rationale for ISDN is more efficient service through lower network support costs. And who are the primary beneficiaries of these lower support costs? The carriers, the very folks who are recommending ISDN standards.

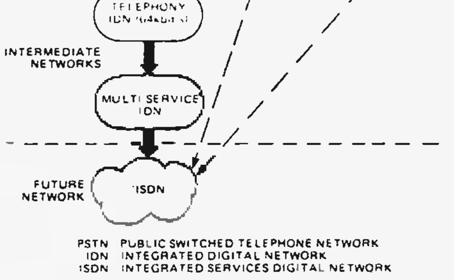
There is nothing wrong with this, but wise users will insist that vendors demonstrate just how and where ISDN services will save money.

This may be difficult to do, particularly for the telephone and telegraph administrations, where price often has little relationship to product or service cost.

The more interesting question, and the one that might make users pay a premium for ISDN, is the question of how it might help them make money. In other words, what new or enhanced services will ISDN give users to offer their customers?

The short answer to that is "very few," since ISDN is itself essentially nothing more than a raw capability.

But there are many potential applications under ISDN that can deliver all of the functionality of a private network without the high costs.



Evolution Toward ISDN.

The crucial role in determing these applications will be played by endusers, combining their knowledge of what the new technology can deliver.

But there is a problem here: The people in an organisation who generally know their markets and business needs are often not the people who understand the technology.

This puts a tremendous burden on communications managers. They must continue working with vendors to manage existing networks while attempting to act as both a catalyst for change and liaison between the company's market development staff and ISDN providers. Add to this responsibility one or more third-party software or consulting services and the job could become monumental.

Vendors can help by recognising that customers for this new functionality are different from the communications professionals with whom they are used to dealing. It is no accident that most of ISDN's potential is aimed at efficient bandwidth management. This is, after all, the traditional domain of communications vendors and corporate telecommunications managers.

The question of what applications are best suited for ISDN will be different for each user. This is a critical question, and vendors can be most helpful by avoiding any excessive hype and mystique. They can also educate endusers on the potential functionality that ISDN offers.

In the age of information overload we now appear to be entering, we seem to have too many answers and not enough questions. The wideband digital highways promised by ISDN are strategically important to users and providers alike, but are useless in themselves.

In order to fulfil the value promised by ISDN, users must first ask the right questions — not only of vendors but of their customers, their markets and Themsleves.

● *Vincent Bates is manager of telecommuniations oversight for the First National Bank of Chicago.*

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Voice and data integration: some directions to follow

By Des Kennedy

THERE is much confusion in the computer and communication industry regarding the advantages and disadvantages of integrating voice and data, not only on the corporate network, but also through the same communication equipment.

Therefore, it is worth holding back and analysing just what questions should be asked before discussing your needs with a communication salesman or Telecom representative.

The relevant salesman or manufacturer's consultant will advise that the solution he is offering is the most cost-effective and efficient networking alternative available.

There are a number of issues not always covered by the intrepid salesman whether he be selling PABXs for voice and/or data, or data-only network solutions.

This brief discussion paper looks at a number of these issues and puts them into some kind of perspective. The paper does not attempt to answer any of the questions but rather gives the MIS or communication manager a direction to follow before discussing his needs with the salesmen. The questions need to be asked of the company management and staff.

The terminal office

First, let us look at the office environment where there may be a requirement for a terminal of some description on each desk beside the telephone.

There are a number of issues, not the least being the type of terminal and computer currently being used.

Are there a number of different computers to which the terminals need to be attached? If so, is the interface different to each?

Do those computers use asynchronous terminal connection or do they require a more complex protocol interface possibly through a controller? If so, is the "protocol conversion" available from any of the possible suppliers effective and stable?

Is the building new? Is the PABX capable of supporting voice and data? Is the telephone cabling to all points satisfactory for the support of both voice traffic, and terminal traffic at 9600 bits/sec or higher? Are there sufficient cable pairs to provide two pairs to each phone/terminal point?

Is the terminal traffic on the network liable to be heavy or light? Are the communication devices available suitable for that traffic type and volume?

Is the computer attached to the PABX in the local office or attached to another PABX? If so, how are the PABXs connected?

Is there sufficient room in the ducting for a Local Area Network implementation? Can you justify the cost of installing the additional hardware and/or software required to support a Lan?

Is there justification in terms of additional features which would allow the installation of a Lan?

If there are at least two PABXs are they joined by 2M-bits/sec links and can the company justify the use of 64K-bits/sec channels for the use of data?

Is there a need for video transmission within the office building? If so, should that facility use the network as well?

The commercial site

Most of the questions asked above can be directly equated to the commercial manufacturing site as well.

A number of companies have gone down one path on the advice of the technical staff, only to find that the equipment does not meet their requirements.

A number of companies that decided, correctly at the time, to instal PABXs for all communication traffic, have found that the increase in demand for terminal connection along with the demand for high-speed process and production control have forced them to re-assess their commitment to PABXs for all traffic.

Some of these companies have started looking at the Lan environment for a number of answers to communication needs.

Questions must also be asked in the commercial applications regarding area of environmental difficulties such as extreme temperatures, location of dangerous chemicals, possibility of flooding, the availability of cabling ducts between buildings on the sites, and the use for more than voice and data applications ie, video and production planning, both of which require much more capacity on the network.

Where is the answer

Perhaps the answer to this situation lies in the need for a more complex, and broader Needs Analysis into the company's requirement.

The analysis should, of course, include Traffic Analysis, to ensure that the current network(s) are investigated to find any current performance problems and peaks in the voice and data environments.

A User Requirements Analysis should be carried out to ensure that the real needs of the users are answered by any network implemented by the company.

The final equipment and network investigation should, if possible, be based on a Strategic Plan developed for the company to give the short and long-term requirements and directions for the communication systems which, after all, are the backbone of the effective operation of the company.

The advantages of this type of strategy are, first, the ability to discuss with communication equipment suppliers (voice and data), public and private carrier suppliers, and enduser equipment suppliers, the corporate needs of the company and not just needs as perceived by the computer department or the facilities-management department.

This would allow both the PABX and the Lan suppliers to provide a solution which would best answer the five to 10-year requirements for all the corporate communication needs.

The resultant network could include both PABX and Lan solutions and would provide the best chance of providing the most cost-effective answers to corporate communication needs.

• Des Kennedy is a senior consultant with Housley Communication Consultants.

Des Kennedy . . . questions that need asking.

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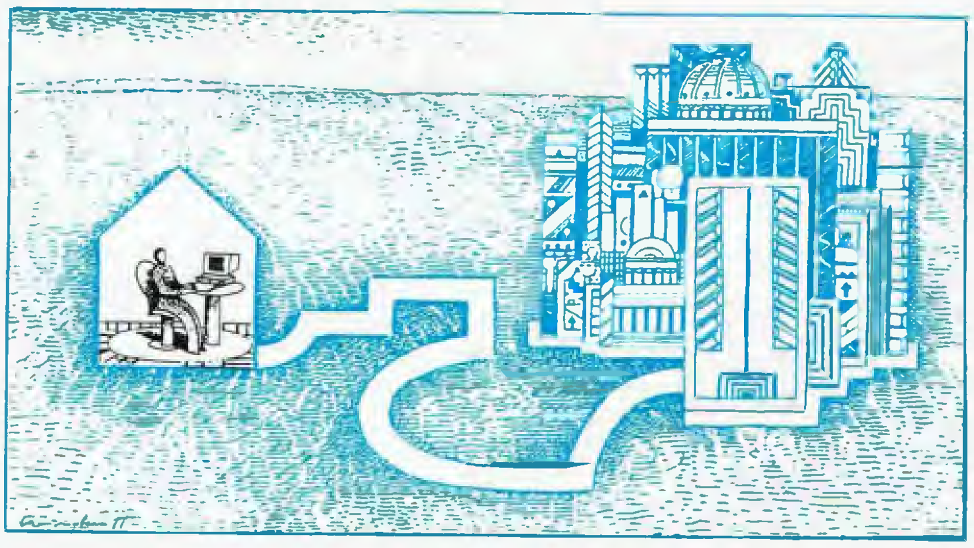
TRADE ENQUIRIES WELCOME

Fax finds favor: users swayed by PC link

(Continued from page 13)



their shoes, they can figure out how to feed a piece of paper into a machine and push a button to use fax."

Since fax eludes the worldwide tangle of conflicting communications standards, users do not have to worry about the error-checking protocols, transmission speeds, or parameters that complicate electronic mail. While some may consider the absence of error checking a liability, it may not be as important an issue as it is with Ascii transmissions.

According to Shih-Chi Lee, vice-president of marketing at Microtek, maker of the Mfax PC-to-fax product, the lack of error checking is an advantage because it simplifies and speeds up transmission without seriously affecting accuracy. "Even if a character has a few pixels missing, it is probably still readable," said Lee.

The critical difference between fax and electronic mail is the ability to quickly transmit graphics. Among other things, this means that unlike telex and electronic mail, fax can send signature, typewritten documents, sketches, and simple charts, which represent a sizable portion of office correspondence. Although a number of electronic mail services have attempted to tackle this challenge, no one standard has yet emerged.

Transmitting bit-mapped graphics is a double-edged sword, however. Since fax output is not in Ascii format, it is extremely difficult to edit. Standalone fax machines do not have editing capabilities.

To alter PC-to-fax documents, you must either use a graphics editor (such as a paint program) to edit pixel by pixel, or you must suffer through the tedious process of using OCR software to translate a fax document back into Ascii code.

Standalone fax machines are designed to send and receive documents, not create them. One of the main advantages of PC-to-fax is that it links fax with the creative capabilities of the PC. Together, these two technologies present intriguing application possibilities.

Although PC-to-fax products are limited to 200 dots/in resolution at present and are unable to reproduce color images, they can still prove valuable for people who use Cad/Cam programs. Architects and engineers, or example, could save time and money by transmitting faxed images of schematics as rough sketches and then sending the final drawings through an express mail service.

Tying fax to PC-based electronic storage and retrieval systems may be a more valuable application for PC-to-fax. Companies could save on storage space, paper, and labor by setting up PCs to scan, store, and retrieve files from an optical disk using sophisticated text management software. A PC fax board could act as the gateway for access to bit-mapped records.

Mainframes too

It is also possible to blend PC-to-fax with the mainframe environment. The New York offices of investment banker Morgan Stanley, for instance, use custom software to integrate a PC with a Gammafax board and an SNA mainframe for overseas communications.

Documents passed around the SNA network are funnelled through an IBM mainframe program called Fax Manager. Gammafax then transmits the document to its destinations.

"We have found the quality of PC fax is better than standalone fax," said Morgan Stanley manager Roger Poulton. "The key to the improvement is the absence of scanning, an intermediary step that causes image deterioration during transmission."

PC-to-fax may also provide a lowend method of distributing output from desktop publishing programs. Conventional electronic mail does not do justice to elaborately formatted and illustrated documents. A PC equipped with a desktop publishing program and a fax board could save on paper, printing, and mailing costs by sending reports and newsletters directly to faxs at multiple locations.

The people at Advanced Vision Research are so impressed with Gammafax that they now sell it as an option with their Pagemaster desktop publishing program. Martin Nelson, vice-president of engineering for AVR, sees a great future for "desktop telepublishing".

According to Nelson: "Even at 200 dots/in we are able to get some pretty impressive printouts. We would rather transmit at a higher resolution, but the fact that we can communicate with the large installed base of fax machines makes all the difference."

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Satellite technology in Australia

The satellite industry, touted as the savior of Australian communications, has been driven by the media but has been given a lukewarm reception by data users. The "birds" have flown, but are finding it difficult to compete with latest terrestrial technologies in this country's unique communications environment. This special feature examines the future for satellite technology and its associated industries in Australia.

By Tom Amos

AUSTRALIA is now into the satellite age, well and truly locked to strategies and utilisation of point-to-multipoint like services, which only satellites can provide. It is now almost 10 years since the Packer-commissioned Bond Report started Australia down the track of satellite ownership and operation. Much has occurred in those 10 years to arrive at a time when there are two operational satellites and a third planned for September 1987 . . . an industry has been created. The health of that industry is of concern if corporate business is to make use of this new resource.

The satellite industry, in its infancy in Australia, will soon have called for tenders for a second generation of satellites to provide a whole new range of services. Most business people in Australia have yet to experience the provision of business services on the first generation, let alone plan for those due in 1992. The industry as it stands today has not been geared to utilise anything other than television services and some specialised applications for government departments. The business acceptance and use of the satellite has been slow. Maybe satellite communications is an industry which has yet to find its way, an industry that has probably been hindered in its development by government enthusiasm.

As it stands, business still needs the bootstrap to accept the satellite as a legitimate telecommunications service provider which can deliver not only cost effective corporate solutions but also valuable services in time.

A brief look at the industry tells me it is not booming, as was predicted when Aussat was to be joint government and private enterprise venture.

History

The first Aussat satellites (100 per cent government owned) were launched and subsequently deployed in 1985 and are configured, for interests sake, with 15 transponders, four of which are high powered (30W) and the rest of 12W power capacity. The high power transponders were intended for a semi "DBS television service" to provide the underserved communities of Australia with an initial television service. It was believed in Canberra that all Australians had the right to watch the ABC. This noble idea was supplemented by the desire to provide a Remote Telephony Satellite Service (RTSS) which would provide a telephone that worked to all Australians and an improved distance education network for the children. These ideas, the government's social justification for the satellite system, have so far failed to be implemented. All that is in place is the delivery of wideband television, no RTSS or outback education on a scale envisaged and hardly any business services.

Before we look at the reason, we must examine the basics for the industry itself.

The government forecasts for the consumer satellite TV industry only a few years ago were rosy. The delivery of BMAC (or specially encoded) television services to the remote communities were on target audiences and units and BMACs to be sold varied between 25,000 and 500,000 units. To ensure supply the government gave a monopoly, when monopolies were unfashionable elsewhere, on supply of units to Plessey to provide television encoders and decoders.

The survey price for satellite service provision was $A1000 to substantiate the market, equivalent to the then cost of a VCR or television set to enable the remote people to buy the service.

Business service providers

Today about 15 per cent (less than 10,000 units) of the projected services have been sold, the cost is closer to $A3000 without duty and tax, and still they stay away in droves. The BMAC industry, the high volume end of the satellite, is not healthy. A dearth of programming, the non introduction of RCTS except in WA and the uncertainty of the television rules and regulations have all combined in an optimistically targeted market, which was both price and service sensitive, to suppress the sale of BMAC units. There are still plenty of decoders if you have the urge to watch the ABC.

Aussat's current charter is to provide complementary services to our national carrier, Telecom, and section 14 of the Satellite Act expressly forbids either PSTN or PDN services on the satellite. Private networks for private use are allowed, but most discussion centred on remote phones and other networks which obviated the need for the Telecom system.

Satellites rarely provide an economic voice service point-to-point solution unless the terrestrial infrastructure is sparse. Such cases as the introduction of point-to-point optical fibre and large microwave systems move satellite economics further into the broadcast and mobile fields. Satellites fit this broadcast role well. Aussat has recently declared that it intends to introduce an initial business service, Starnet, which utilises the thin route properties of the satellite as a product in its own right (*Communications World*, Feb, p1 and April, p1). The intention is to introduce mobile services also on the next generations of Aussat.

There are two distinct suppliers in the marketplace who offer hardware for the user to purchase and construct a network, or who offer services. The service providers include AAP, Equatorial and MDN, and all of these companies may, with Aussat's blessing, combine space segment and equipment to produce an end to delivered service. Similar arrangements are available for video conference service operation with

(Continued page 16)

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Over regulation, poor marketing hinder industry

(Continued from page 15)

itinerant access being the most cost effective use of high bandwidth type services. Conventional services are restricted to provision of voice, data and image services and the most cost effective mechanism today due to the cost is to access a multitenant shared hub station and provide service by this means, or establish a leasing arrangement on service.

Both AAP and MDN have supplied some services to private users, although the prohibitive Telecom interconnect rules and fees have escalated the cost of service so today only a few business users have even tried it. By far the most successful of the private service operators has been the Queensland government with its Qnet shared use system. Over 100 services for semi and government users have been provided.

Telecom also offers a premium satellite service called Iterra, which can provide direct network access from any location in Australia using 3.7m antennas with the user paying upfront installation and service provision charges plus STD rates. Telecom is commissioning a parallel major city service to that provided by Aussat with its MCES system located in all capitals.

Aussat is also standing in the marketplace offering a custom business service.

Equipment marketplace

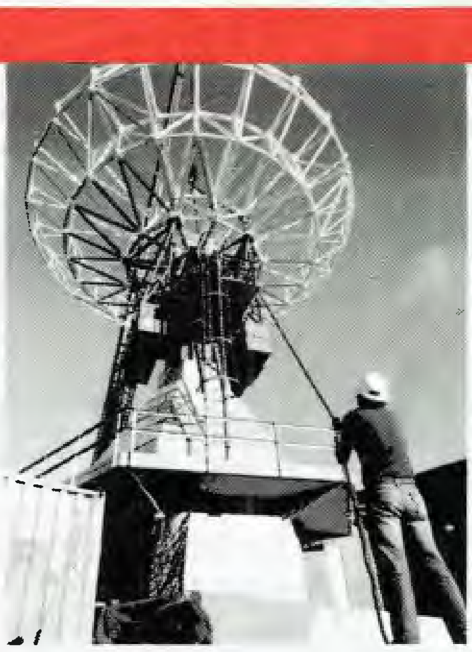
Several hundred earth stations and Vsats (very small aperture terminals) have been delivered to users in Australia. The majority have been simple SCPC systems for government or semi-government users and have been supplied by NEC of Japan. Telecom, DOA and Aussat have all purchased equipment from NEC.

With all the high tech industry surrounding the satellite industry one would be forgiven for thinking that the supply industry is a high flyer in Australian business. The reality could be not further from the truth, with but a few suppliers now left in the industry. Most have gone, taking with them the stories of incompetence, woe and delay so common in the semi-government arena in Australia.

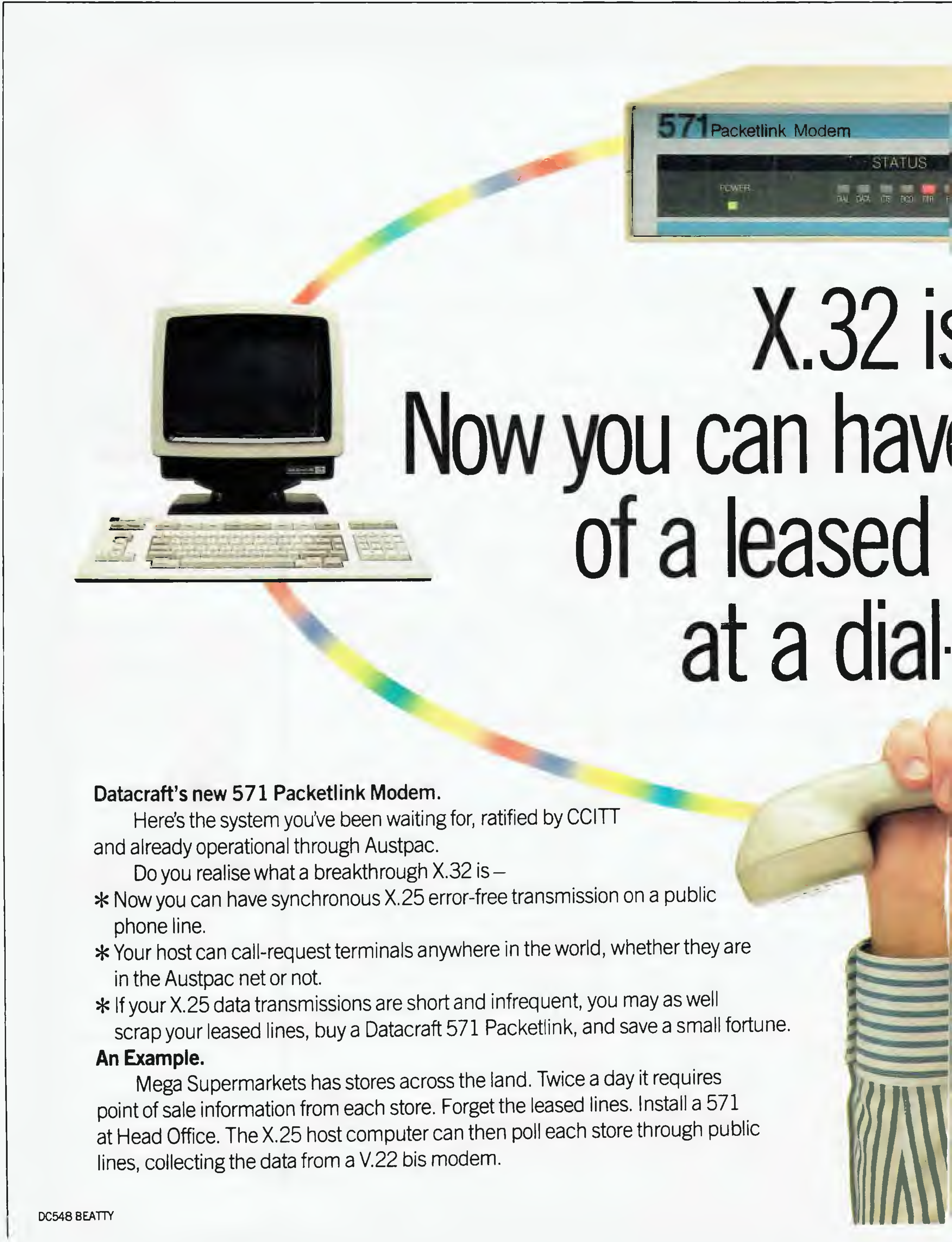
All that is effectively left is the Japanese company, NEC, which has a strategic presence in Australia and Australian telecommunications, and a few smaller specialised companies such as Equatorial, MDN and Microdyne, which provide vertical satellite solutions and equipment for data and voice networks and solve long distance problems. Gone, except in spirit, are most of the other Japanese companies, US and European operations which all came to Australia expecting the domestic satellite system to offer opportunities for private network provision under fair rules and conditions.

This slow start has not been helped by Telecom's historic and almost fanatical opposition to the satellite. Its hurried development with NEC of a terrestrial version of the RTSS service known as the DRCS system was amazing. This alternate program has almost cost Australian the same as the total satellite project and puts some perspective into Telecom's opposition. Telecom has now embraced satellite technology as only a 25 per cent stake holder in Aussat can, and is now offering competitive services to Aussat (which offers almost none except TV after two years of on-air operation).

Australians are similar to the French in more ways than the average Australian would care to admit. Over the years we have been continually afflicted by bureaucratic far-sighted decisions which have ignored commercial world trends and headed down the path of technical excellence and world uniqueness (dodo-ism?) and subsequently small market size and high cost applications. Such historic decisions as the utilisation of the FM bands for TV transmission and the spacing of the TV channels rank equally as well with the selection of an almost unique Ku band satellite system and DBS BMAC. The Aussat Ku frequency of operation is different from that used internationally and domestically in both the US and Europe. The result has been high cost for equipment, long delays and small production runs. A better choice would probably have been a C band satellite system as originally suggested by Donald Bond or at least a world compatible Ku system so that if an indigenous manufacturing market sprang up then it could at least sell the existing products developed overseas. The DBS experiment would have had a whole different complexion if . . .



The satellite industry is still waiting to happen as a result of long sales cycles and wariness on behalf of business to the changing rules and regulations. Many millions of dollars have been invested by the government and private industry in establishing a place for modern telecommunications to change the face of Australia. It appears that the fledgling industry, hampered by a whizz bang technology crutch, is already suffering from poor marketing, over regulation and predatory service provision, and the last two definitely need to be addressed by some independent regulators if it is to move.



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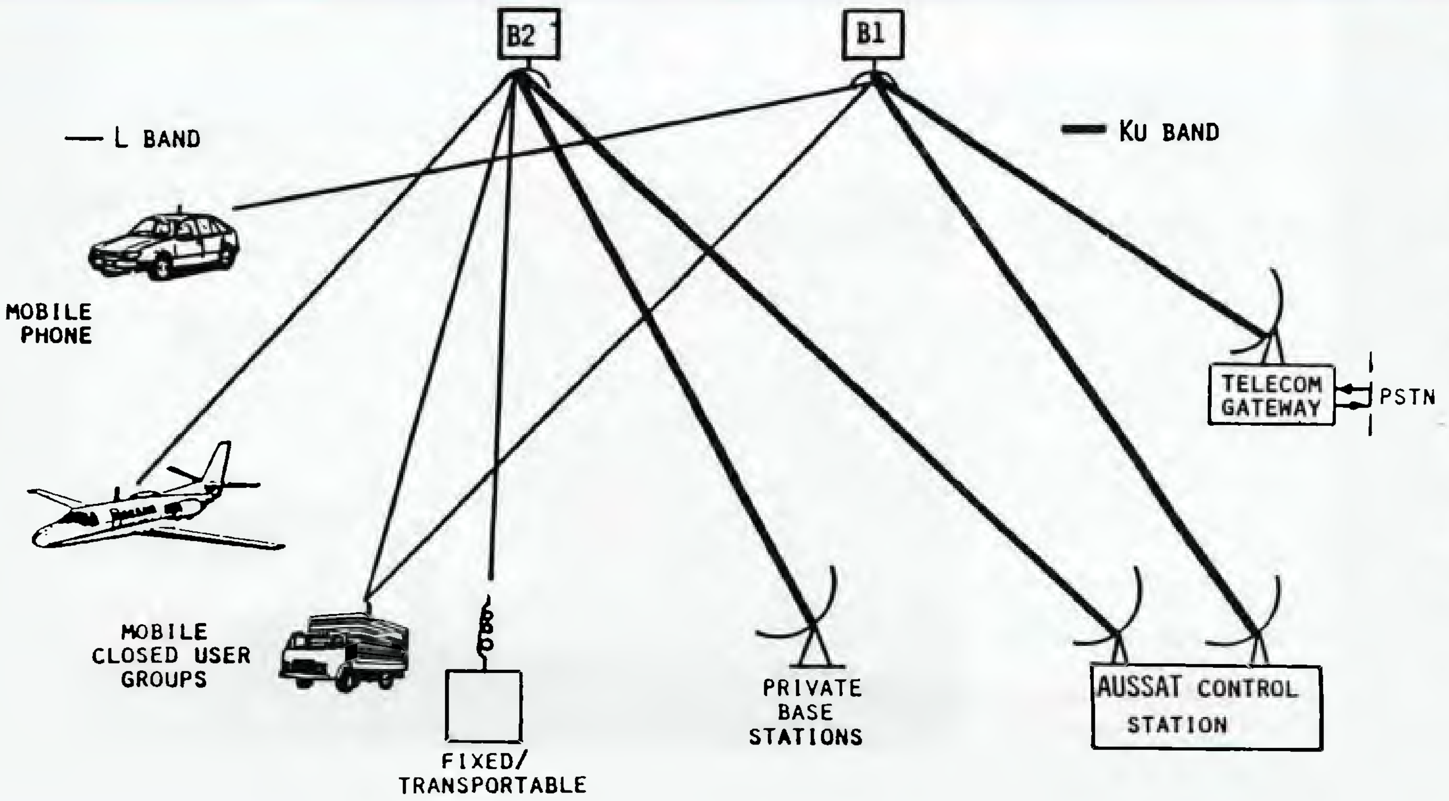
DC548 BEATTY

Plan may lead to a world first for Aussat

By Luis Huesch



AUSTRALIA's space-based carrier, Aussat, is relaunching its second-generation satellite plans, with L-band mobile communications capacity now included in the request for tender.

If the proposal is accepted by Cabinet, the nationwide mobiles service will be a world first when it becomes operational in the early 1990s.

The capability to serve what are regarded as high-growth markets — land mobile, aeronautical, coastal maritime and a superset of cellular radio communications — has been part of Aussat's long-range objectives, spelled out at an industry briefing early this year.

But new advances in technology, including miniscule electronically steerable antennae not much bigger than pie dishes, and strong early demand for Telecom's repeater-based Mobilenet cellular radio, helped firm support for Aussat's options. L-band capacity, initially an option subject to Aussat making "a viable business case", had now been given the green light, said Aussat's public affairs manager, Leighton Farrell.

> *‘An unexpected election has thrust Aussat's timetable slightly off orbit with its draft request for tender specifications now expected to go to Cabinet in early August. Aussat originally planned to issue the complete RFT in July.’*

An unexpected election has thrust Aussat's timetable slightly off orbit, with its draft request for tender (RFT) specifications now expected to go to Cabinet in early August. Aussat originally planned to issue the complete RFT to industry in July.

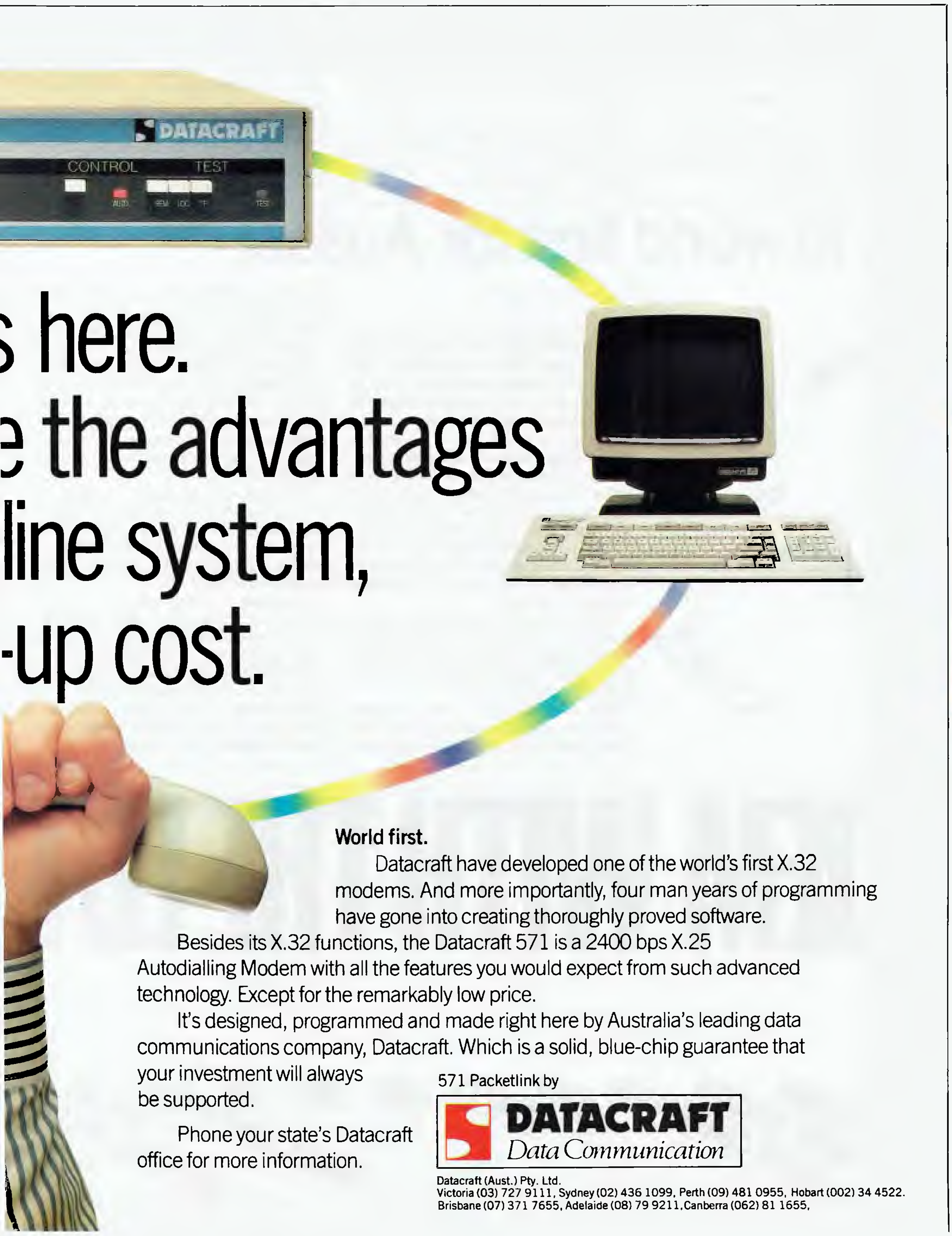
Plans documented in February called for one L-band transponder on each of the B1 and B2 replacement satellites, due for deployment in March 1993 and January 1994 respectively (*Communications World*, March p12 and 15).

Planned capacity is several hundred voice channels servicing a mix of low-gain, mid-gain and high-gain terminals for two-way mobile voice and messaging, one-way messaging and position-fixing purposes.

A Starnet-type configuration with access controlled by Aussat's Dama (demand-assigned multiple access) computer would cater for private networks, with likely users in the transport, exploration, police and emergency services, remote education and similar areas.

The 150-watt L-band transponder proposed would use frequencies of

(Continued page 18)



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Comms take off in Starnet service

THE introductionof satellite technology has transformed the face of broadcasting and telecommunications in Australia over the past two years.

With the Aussat satellite system now well established, the business community and public sectors are reassessing their communications needs as the development of satellite-based services offers new opportunities for choice and diversity.

The communications revolution began in 1985 with the successful launch of Aussat's first two satellites and has proved to be very attractive across the whole spectrum of telecommunication users so that demand for service has resulted in 80 per cent of the capacity available on the two satellites being contracted, and either being in service or due to come online by the end of this year.

As the Aussat system matures many new applications are being brought into service, including the development of private communication networks for banks, retail outlets and both State and Federal government authorities.

Starnet is one such service recently introduced. It is a satellite-based private communications system providing voice, data and video capabilities between a head office and a number of branches or remote locations. Starnet services consist of networks composed of:

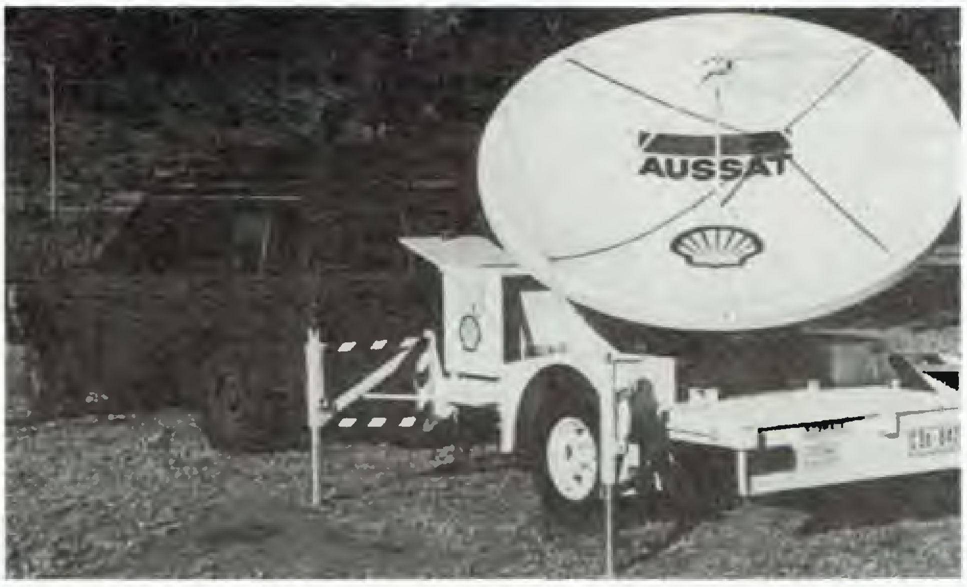
- A central hub earth station at an Aussat city earth station and connected to a company's head office.
- A small earth station — usually 1.5m-2.5m in diameter with associated electronics (known as Vsats — very small aperture terminals) at each branch or remote location.

The first Starnet service will begin with a trial by the Commonwealth Bank in Sydney in July using Vsats at three branches linked to the bank's main computer centre through a hub earth station at Aussat's satellite control and operations centre at Belrose.

Vistel Ltd, the Victorian government communications company signed a contract with Aussat on June 11 for the introduction of a second Starnet service in Victoria.

The network will be primarily used for two-way data transmission but will also allow for limited two-way voice services and a one-way video channel.

Earthstation on wheels



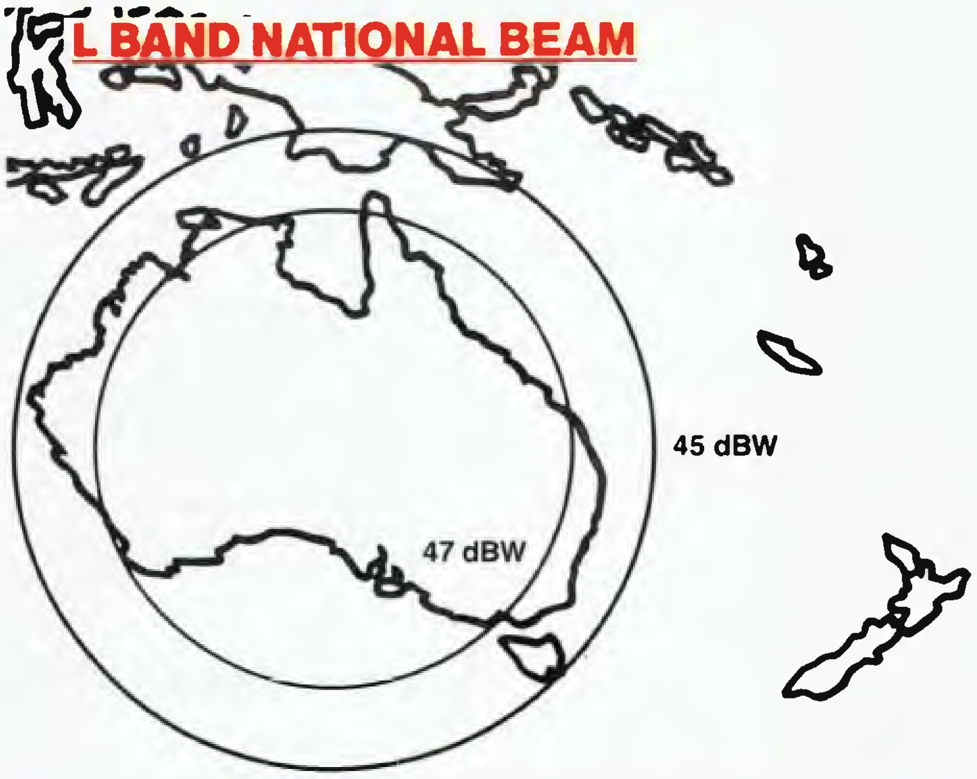
SYDNEY — Aussat Pty Ltd has released a transportable earthstation for use on remote sites. The Interface AM2400 is an Australian made station measuring 2.8 metres by 2.0 metres and standing 3.0 metres high when the 2.4 metre dish is in the operating position. It weighs just over a tonne.

The transportable was designed by Aussat engineers and constructed by Vicoach and Aussat personnel in Melbourne. Rugged electronics were provided by Codan of Adelaide and the aluminium dish was made by Andrews Antenna in Melbourne.

Five of the earthstations have been made, and the first has been leased to Shell Australia, which is using the device for communications between a base camp in the Great Sandy Desert and head office in Melbourne.

Aussat Pty Ltd, 54 Carrington St, Sydney 2000.
Tel: (02) 238 7800.

Plan may lead to world first for Aussat



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1646.5-1660.5MHz for uplink and 1545-1559MHz for downlink to and from mobiles and fixed/transportables. The antenna for mobile L-band transceivers, an electronically tuned array that automatically compensates for the constant antenna "misalignment" in mobile use, is a Canadian design. Manufacture in Australia is likely, though, because of the 40 per cent Australian content requirement covering the "optional experimental and scientific" addon packages for the new spacecraft.

Fixed private base stations would use the Ku-band transponders, which would be cross-linked to the L-band transponder aboard the satellites.

Voice and/or low-speed data traffic to and from the mobiles from other than private fixed base stations would be routed by Ku-band via Aussat's major city earth station at Belrose, Sydney.

The Australia-wide L-band coverage could also be used as an overlay on Telecom's Mobilenet cellular radio system with its inherently limited scope. Aussat's offering would be "a good example of a complementary service", said Colin Campbell, Aussat's chief marketing executive.

According to Campbell, minority shareholder Telecom has already shown interest in what might loosely be described as a shared-tenancy PABX in the sky. Aussat makes provision for a separate Telecom gateway to the public switched telephone network (PSTN).

Campbell said experiments underway with the Canadians to packetise voice transmissions into "under 9.6k-bits/sec are looking good". He estimated that a complete satellite mobile package could cost as little as $A5000 to $A10,000.

According to Campbell, dual L-band capacity on the B-series "birds" will carry a bonus for mobile users: they will be able to get an accurate position-fixing service.

This is because the signal from the mobile will be received by both satellites, permitting Aussat's control station to perform an electronic "triangulation" yielding positions accurate to within a few metres.

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AUTO SPEED
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1200
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300
HAYES COMPATIBLE
V25 BIS
DIAL BACK SECURITY
HEL
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MODEMS MULTIPLEXERS TEST EQUIPMENT DATA PABX'S

Network users cash in on diskless workstations . . .

SOUTH MELBOURNE — The market for diskless workstations is gathering pace as the models from an increasing number of vendors arrive in Australia and are snapped up by users keen to cut networking costs and improve network security.

One of the early players in the field was 3Com's 3station, which was released by Imagineering last month (*Communications World,* June, p25). The first shipment was sold immediately, most of it apparently to a large financial institution in Melbourne. Other diskless PCs available include two models from Televideo, but market competition will hot up further late this month with the arrival of a $A1495 machine from Novell.

The Novell device was built around the company's Ethernet communications board (*Communications World,* June p21), which can be disabled to fit any other communications card to suit user requirements.

New player

The latest player to join the diskless workstation game is Datatel, which has taken delivery of a shipment from Kimtron and, after unveiling the units at PC87 in Melbourne last month, is gearing up its marketing campaign. A Datatel spokesman said the Kimtron Satellite is intended for networking with IBM PC XTs and ATs, and is compatible with "remote boot" networks, such as Kimtron's K-Net and XL-100, 3Com's Etherlink, Corvus' Omninet, Standard Micros' Arcnet and Proteon's Pronet-10, a spokesman explained.

"We see a growing market for these products as users of local area networks demand more secure environments and realise that many users on networks are fulfilling clerical tasks that cannot justify the cost of a standalone machine," the spokesman said. "In standard form a diskless PC workstation comes with all the communications facilities built in and with the circuitry for color in place. Modifying a PC to give the same functionality would soon overrun the budget," he claimed.

The improved security comes from the lack of any removable media, on top of normal networking security measures, although users can insert hardcards and so run local hard disks if necessary.

Early deliveries of diskless workstations, such as Kimtron's Satellite (pictured) have been snapped up by network users eager to control costs and network security.

Unlike 3Com's offering, which is built on Intel's 80286 processor, the Kimtron Satellite is built on an NEC V40 chip which can be switched to run at 5MHz or 8MHz. A spokesman said the V40 is compatible with Intel's 8088-II.

The Satellite's motherboard includes 256K-bytes of Ram, memory sockets to expand to 640K-bytes, a socket for a maths processor, two expansion slots for full sized PC compatible boards, an RS-232C port, a parallel printer port, and circuitry to control Hercules-compatible mono graphics or IBM color graphics.

Prices vary on configuration, which depends on the user's communications requirements. Datatel is at 19 Raglan St, S Melbourne 3205. Tel: (03) 690 4000.

Netware the solution for Wang support

SYDNEY — Australian systems house Solution 6 has developed a version of Novell's Netware that supports the Wang Professional Computer

Derek Johanson, a director of the company, said the businesses of many of the company's clients were well suited to PCs and so to networks. The company had assessed a number of network operating systems and had concluded that Netware was superior to other systems tested.

However, the company had specialised in Wang products and Netware did not support the Wang PC as a workstation. "So Solution 6 undertook the necessary research and development work to provide that capability," Johanson explained.

He also claimed that the Wang PC retains its functions when operating in the Novell environment. "This means users can continue to use the full capabilities of the machine."

Novell netware offers access to very large online disk storage, Johanson explained. It also allows larger data files than the MS-Dos restriction of 32M-bytes, as well as superior growth and expansion opportunities, enhanced IBM compatibility and effective print spooling, Johanson added

Solution 6 is at Level 12, St Martins Tower, 31 Market St, Sydney 2000. Tel: (02) 29 5333.

. . . IBM joins rush with an unannounced PS/2

FRAMINGHAM, Mass — IBM is quietly making a diskless version of its Personal System/2 Model 30 available to at least one large corporation, while some US companies are using the Model 30 equipped with disk drives to replace terminals.

A source within IBM claimed that American Airlines will be using diskless Model 30s as part of its Sabre reservation system and will be installing the machines in travel agents' offices over the next few years.

The airline will use a local area network tied to a file server running Novell's file server operating system. The diskless Model 30s will boot from the file server and will access IBM host computers through the host gateways that will reside on the file server.

In the US the Model 30 is being offered to large corporate users at volume discounts of up to 40 per cent. In diskless form it would allow MIS departments to control the data and applications that endusers access from a host.

A representative of 3Com said IBM's entry into the diskless workstation would boost the market for such products. "The major argument against diskless workstations has been: 'Are they a good thing?' The IBM stuff will be helpful in overcoming the doubts."

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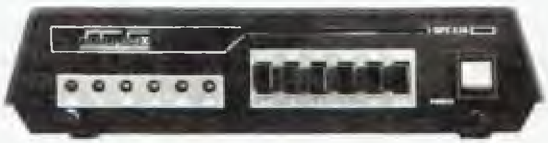


LOCAL DATA DISTRIBUTION SERVICE

Reliability tops Lan survey

FRAMINGHAM,Mass — Reliability, performance and service and support are the three most important considerations for users purchasing local area networks. The factors were uncovered in a survey conducted by First Market Research of Boston.

The survey, which asked 200 users about their network installations and plans, also revealed that vendor viability, network expansion potential, multivendor connectivity and user friendliness were also highly ranked considerations.

In ranking 15 factors that influence their decisions the respondents, 97 per cent of whom were involved in the purchase of Lans, put ease of installation, the number of users supported and price at the bottom of their lists.

Some 71 per cent of those surveyed already had at least one Lan installed, and the number of Lans at each site averaged 2.3. Of those, IBM was the primary network vendor for 22 per cent, followed by Digital Equipment Corp for 17 per cent, Novell for 10 per cent, and 3Com for 8 per cent.

IBM has overtaken DEC as a primary local area networking vendor for the survey respondents, despite the fact that DEC's offering has been available much longer than IBM's Token Ring Network. The survey results indicated, however, that IBM will not widen its lead in the next 12 months because the same pecking order emerged when users were asked about plans to instal Lans at a single site during the next 12 months.

Users rate factors influencing decisions to purchase local networks

	Of critical importance	Very important	Somewhat important	Not important
Reliability	38%	54%	7%	0%
Performance under heavy system traffic	24	47	25	3
Service and support	23	58	17	1
Vendor viability	22	47	24	1
Expandability	20	62	15	2
Multivendor connectivity	15	42	32	10
User friendliness	13	50	33	3

NOTE: These numbers are based on a survey of 200 *Network World* subscribers.

SOURCE: FIRST MARKET RESEARCH.

The breakdown was: one or more IBM Token Ring Networks will be installed at 22 per cent; DEC Ethernets at 18 per cent; Novell Netware supported networks at 17 per cent; and 3Com Ethernets at 12 per cent.

Applications run on the Lans were not heavily concentrated in any single area. Some 10 per cent were using networks for database access, another 10 per cent for general purpose applications, 9 per cent for office automation, and 6 per cent for factory or manufacturing networks.

The results were similar to a different survey by International Data Corp of microcomputer managers at large organisations. IDC found that some 33 per cent of those managers who planned to instal networks said they would go with IBM's Token Ring, 25 per cent with Novell Netware networks, 18 per cent with DEC's Ethernet and 12 per cent with 3Com's Ethernet.

The IDC study showed that 63 per cent of the managers surveyed intended to instal Lans in the next 12 months.

The survey was conducted to determine how IBM's recently announced Personal System/2 and OS/2 will affect micro managers' purchasing decisions. The managers indicated that the new products would have no impact on their plans to purchase networks.

Sea releases electronic mail system

NORTH SYDNEY — An electronic mail system based on IBM Personal Computers and using standard telephone lines has been developed and released by System Enhancement Australia (Sea).

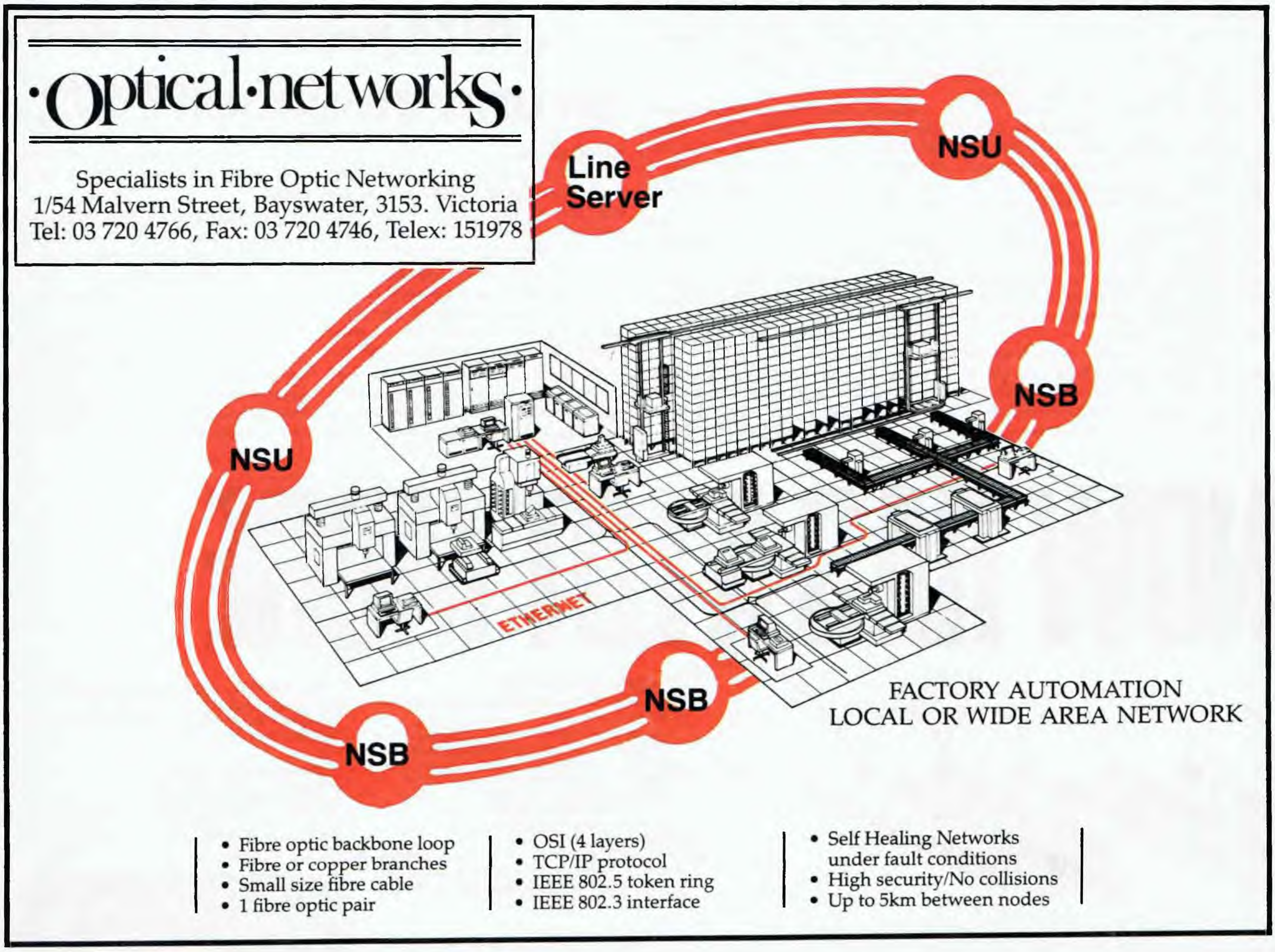
A spokesman said the Seadog system can send messages or files and can be configured to allow users to request files or file updates from other Seadog systems. This can also be automated to allow automatic distribution and updates of any files or programs, the spokesman claimed.

It requires any IBM PC, XT or AT type machine with at least 128K-bytes of main memory and standard serial port. A fixed disk is recommended, but not essential. The machines are used with a Hayes compatible autodial modem and the system supports rates of 300, 1200, 2400, 4800, 9600 and 19,200 bits/sec.

Seadog consists of a user interface program, which is used to enter and read mail messages, and a network server, which is left running when the machine is not otherwise being used, or permanently if the machine has multi-user facilities.

The message delivery and file transfers are done in the early morning to take advantage of lower phone rates, the spokesman said.

System Enhancement Australia 19 Chuter St, N Sydney 2060. Tel: (02) 922 6658.



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- High security/No collisions
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Link Lines

SANTA CLARA, California — After a protracted series of meetings with Microsoft, 3Com Corp has determined that it will be able to upgrade its existing servers to support IBM's OS/2 operating system. "We believe the 3Server3s now shipping will be able to support OS/2 stations with little or no software upgrade," said Bob Metcalfe, chairman of 3Com. For users wanting to run OS/2 applications on their servers, 3Com plans to offer a board level hardware upgrade that will contain an 80386 chip and 2M-bytes of Ram. It is expected to be released in mid-1988 at around $US3000.

MOUNTAIN VIEW, California — Bridge Communications is expected to announce in the near future a board that will let a PC support an Ethernet session, a DEC Vax session, a modem session and an IBM mainframe session simultaneously. To be called the Personal Communications Server/1 (PCS/1), the board connects an IBM PC, XT, AT, PS/2 Model 30 or compatible machine to an Ethernet or Bridge 5M-bits/sec broadband Lan. It will also let the PC communicate with other devices on an Ethernet Lan. The PCS/1 will support Netbios, TCP/IP, Novell's Netware and 3Com's 3+ operating systems. It will not run on an IBM Token Ring Lan.

MEDFIELD, Mass — A local area network using twisted pair wire and supporting up to 127 IBM PCs within a range of 330 metres has been released by Trans-M Corp. A spokesman for the company claimed the 127 PCs can be linked on the Net-127 PC Lan at a cost of just $US249 per drop. He explained that Net-127 is based on a PC addon board that provides RJ-11 jacks, which enable PCs, printers and other peripherals to be daisy chained using two or four wire twisted pair cables. The product uses the carrier sense multiple access with collision detect method typical of Ethernet, but is not compatible with Ethernet. It will support all MS-Dos commands, the spokesman said. Trans-M is at 28 Blacksmith Drive, Medfield, Mass 02052. Tel: US (617) 359 5144.

BOCA RATON, Florida — Gulfstream Micro Systems has announced a Lan version of EZ-Fax, which lets PCs transmit via phone lines to facsimile machines conforming to the CCITT Group 3 standard. A spokesman claimed an EZ-Fax board can be installed in any workstation on the Lan and that workstation then runs the EZ-Fax Lan Gateway program, which sends and receives fax pages in the background. Other workstations, as well as the gateway machine, run the EZ-Fax Lan Workstation software while EZ-Fax functions are performed on the gateway PC. Incoming pages are converted to printer or display formats. Lans running Novell's Netware are supported now, while future releases will support IBM's PC Network and Microsoft Networks, the spokesman claimed. The board and single user software cost $US1495. Gulfstream Micro Systems is at 1065 S Rogers Circle, Boca Raton, Florida 33431. Tel: US (800) 443 0500.

MILPITAS, California — Univation Inc has released a $US399 Ethernet adapter card that runs on IBM's PC, XT, AT and compatible computers. The Lifelink NC515U card is a low cost version of the company's Lifelink NC516 card, which includes Ethernet and TCP/IP integration. The low cost card is intended for users who do not need communications between dissimilar systems. Univation is at 1231 California Circle, Milpitas, California 95035. Tel: US (408) 263 1200.

Steps to ease token shortage

By Patricia Keefe

NEW YORK — IBM is taking steps to ease the shortage of Token Ring boards, according to Ellen Hancock, president of IBM's Communication Products Division. The adapter cards have been in short supply for 15 months.

IBM is both adding workers to the production line and trying to increase its production output, Hancock said. However, she would not pinpoint when the company expects the cards to be available in volume.

"We are trying to react to demand," Hancock said, adding that IBM has been pleasantly surprised by substantial demand for the Token Ring products.

She claimed two-thirds of IBM's largest customers have installed the Token Ring. Acknowledging that other customers have been inconvenienced by the shortage, she said, "We intend to fix that."

US dealers reported that Token Ring boards are still in short supply. As a result, some dealers have stopped recommending IBM's Token Ring and are steering clients toward networks from third parties such as Novell, 3Com and Banyan Systems.

Even shops traditionally true to IBM are circumventing the company and putting in alternative products, a dealer said.

While Hancock assured users that they will see an increase in availability of Token Ring boards, she said IBM intends to "stay with the current speed" of 4M-bits/sec.

Lan works well with PS/2

CLAYTON, Vic — ACI Computer Services has demonstrated the IBM Token Ring Lan on the IBM Personal System/2 computer, and has found the performance to be extremely good.

An ACI spokesman, who said he believed it was the first time the two had been shown operating together in Australia, claimed initial performance testing showed that the combination of the new software and hardware had doubled Lan performance.

"This is equal to the speed of a local AT hard disk and is faster than any other Lan currently available commercially," the spokesman said.

He added that the improved performance could be attributed to the combination of the new PS/2 machines and their exceptional hard disk performance, the Micro Channel bus and the new Token Ring card, combined with the major performance gains in Dos 3.3, IBM PC Lan 1.2 and the Lan Support Program.

MEMO

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From: Computerworld
Subject: EXPORT — Now, Soon or Later
cc: Managers and Sales Directors

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Review: Don Crabb explains why Dataflex 2.2 is so easy to use.

Quiet optimism for future of Lan database

DATAFLEX 2.2 is a relational database management system and fourth-generation programming language from Data Access. It comes in single- and multi-user versions for a variety of operating systems (including Dos, Xenix, CP/M, Concurrent Dos, Unix).

We tested the multi-user version 2.2, suitable for installation on PC Lans running the Novell Advanced Netware network operating system (compatible with Dos 3.1 and later).

We also tested Dataflex 2.2 against other highend multi-user relational databases, and it fared quite well. That competition included Informix/SQL, Revelation, and Unify. In comparisons with the rival 10Base from Fox Research it proved again to be a worthy competitor.

Features: Dataflex has about the same large set of features as Unify, Informix/SQL, Revelation, and 10Base, while it provides some features that none of those systems can match. These include a set of preprogrammed procedures for building custom database applications, extensive color windowing support, and an easy-to-use function key re-assignment utility.

Dataflex (like Revelation) lacks the SQL query language of Unify and Informix SQL, and it also lacks their host-language interfaces.

Instead it provides a complete set of ready-to-use data and forms processing procedures so users can avoid writing Pascal, Basic, or C programs in order to build a custom database application.

Dataflex is completely menu- and prompt-driven and can produce data files separate from its application programs. Dataflex also includes password protection and other security options for protecting data from unauthorised access over the Lan.

Like Unify, Informix/SQL, and 10Base, Dataflex supports Isam (indexed sequential access method) keyed records using multilevel B+ index trees to make sorting and searching fast.

One of the niftiest features of Dataflex is its windowing support, which is at least as good as any other mainframe database we have used. You can control the size, position, and color of each screen page, using them to offer pulldown menus in a custom application, or to hide special data entry screens within other screens.

Information that your screen previously displayed remains after a window change and can easily be re-displayed.

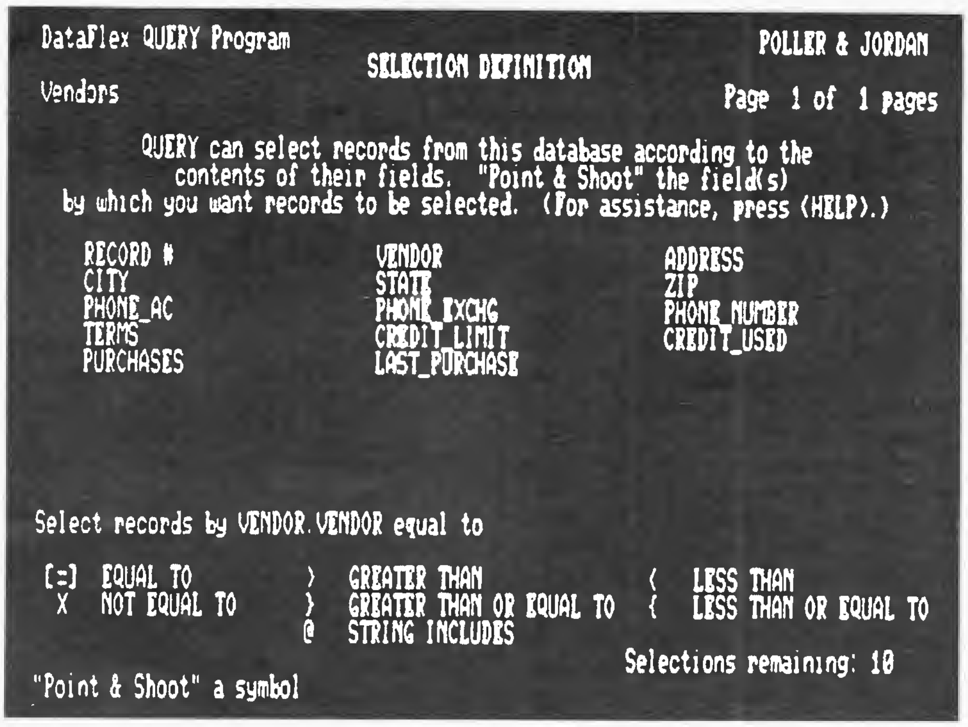
Although Dataflex lacks an SQL implementation, its own query and reporting system is quite powerful. Like the rest of Dataflex, the query utility is menu and prompt driven. It can be used as an ad hoc report generator, and for formal reports since query code can be stored, incorporated into Dataflex program application and compiled to become a permanent report.

> *‘We never had to wait for Dataflex to catch up to what we were doing’*

Dataflex is structured around its running system, and each functional part is directed by the system. In addition to the Query utility, the parts of Dataflex include the menu handler, indexing program, program text editor, automatic program generator, Ascii file handler, program compiler, file definition utility, and the utility to create new Dataflex commands.

One of the best features of Dataflex is that if you do not want to master all of this, you do not have to. The system is fully usable for building all kinds of custom database applications without knowing about the secrets of its internal workings. If you are the nosy programmer type, however, you will be happy to know that Dataflex reveals its inner workings.

The automated methods provided by Dataflex to help users build files and programs cover all aspects of database creation. If you follow their prompts, these automated systems will take you through screen design, field placement, menu creation, and program compilation. Prompts will also lead you through data entry, data query, and reporting.



```
DataFlex QUERY Program                                             POLLER & JORDAN
                                  SELECTION DEFINITION
Vendors                                                          Page  1 of  1 pages

              QUERY can select records from this database according to the
                 contents of their fields.  "Point & Shoot" the field(s)
        by which you want records to be selected.  (For assistance, press (HELP).)

     RECORD #                   VENDOR                    ADDRESS
     CITY                       STATE                     ZIP
     PHONE_AC                   PHONE_EXCHG               PHONE_NUMBER
     TERMS                      CREDIT_LIMIT              CREDIT_USED
     PURCHASES                  LAST_PURCHASE




Select records by VENDOR.VENDOR equal to

 [=]  EQUAL TO           >   GREATER THAN                 <   LESS THAN
  X   NOT EQUAL TO       }   GREATER THAN OR EQUAL TO     {   LESS THAN OR EQUAL TO
                         @   STRING INCLUDES
                                                      Selections remaining: 10
"Point & Shoot" a symbol
```

Dataflex lacks SQL but its query utility is powerful.

Overall, the features of Dataflex 2.2 are as comprehensive and complete as you would wish from a highend database program.

Performance: We tested Dataflex 2.2 on a Lan consisting of 11 8MHz IBM PC ATs each with an internal 20M-byte hard drive and 1M-byte of Ram. Ten of the PCs served as client workstations on the Lan, while one, with a second 20M-byte drive, was reserved as the network file server.

The network also had one Hewlett-Packard Laserjet printer, a Sysgen 60M-byte tape backup unit, and a Toshiba 1351 dot-matrix printer attached to the server. Three of the workstation ATs had IBM Graphics Printers attached to them.

We used PC-Dos 3.2 on each workstation, with Novell Advanced Netware serving as the Lan software. The total length of the network from end to end was about 152 metres.

The capacity limits of Dataflex are more a condition of the Dos operating environment than of the program. It can keep track of 255 files per system, each file limited in size only by the Dos disk limitation, while the number of simultaneous open files is limited by available memory (the manual includes a thorough discussion of how to estimate memory usage).

Each file can hold more than 16 million records. Maximum record size is 16K-bytes, which could preclude Dataflex from text database application. The maximum number of fields per record is 255. A Dataflex application can have up to 5000 program lines in it, and each line can be 255 characters long. You can have up to 32,000 program variables.

You could build a database composed of as many as 2900 windows. The B+ tree multilevel Isam format indexing is maintained online. Dataflex can read and write files for data interchange with other programs that conform to the Ascii text standards, including comma-delimited files. Dataflex does not directly support other external file types (such as Sylk or Dif), but clever programming can work around this omission.

Despite its large data handling capacity, Dataflex still proved to be fast. We tested its speed at retrieving a single-indexed record (using a six-character index key) from a file containing 40,000 records of 512 bytes each. Dataflex took 0.95 seconds over our test Lan (the other Lan stations were idle).

This is just slightly slower than Informix/SQL, the leading performer in earlier tests that included Unify, Revelation and 10Base.

Our timings of Dataflex at query and retrieval matched up with our subjective experience using the program. We never had to wait for Dataflex to catch up to what we were doing. It presented screen alternatives quickly, zipped through menus, gave onscreen help quickly, and produced what we asked for — quickly.

As a result of this test speed, and considering its powerful capabilities, we rate Dataflex a very good performer.

Error Handling: Although we were not always keen on deciphering some of the error messages we received from the Dataflex compiler (when we were building applications), they were all explained in their entirety in the reference manual. Despite errors and warnings of various types during program generation, we never lost any program, menu, or screen definition data — an important consideration for a Lan database designed to build custom programs.

Nobody's perfect

Likewise, the only error torture test that would provoke a data loss from within an application seemed to be physical disruption of the Lan (pulling out cables, turning off the server, and so on). Even this loss could be minimised (albeit at the expense of slower performance) by instructing Dataflex to write its storage buffers to disk and close files when they were not immediately needed — a significant boost to error handling and recovery.

Dataflex 2.2 was not perfect at error recovery, but it protected us much more than a "satisfactory" Lan database would, so we rate it as very good for error handling.

Value: In our product comparison, Dataflex was not the most complete nor the most powerful of the programs, but it was our overall favorite because it has no serious weaknesses in the categories considered. Further, Dataflex had the advantage of matching up well with the kinds of database applications we typically create and use.

Overall balance is the best way to characterise Dataflex's performance and ease of use. The program was easily usable by our novice group, who never felt frustrated or stymied. Dataflex allowed us to store, process, and retrieve multiple linked files at different Lan workstations as they were located on the stations' local disks — just what a Lan database is supposed to do.

- *Don Crabb teaches, and is director of undergraduate computer science instruction, at a major US university. He regularly reviews software.*

COMMS WORLD

REPORT CARD

DATAFLEX 2.2	Unacceptable	Poor	Satisfactory	Very Good	Excellent
Performance	☐	☐	☐	■	☐
Documentation	☐	☐	☐	■	☐
Ease of learning	☐	☐	☐	■	☐
Ease of Use	☐	☐	☐	■	☐
Error Handling	☐	☐	☐	■	☐
Value	☐	☐	☐	■	☐

SUMMARY

Dataflex is a single-user/multiuser relational database management program for the IBM PC; not copy-protected. Pros: Though fairly powerful, Dataflex is easy to learn and use; stable Lan behaviour; builtin procedures make custom applications easy to create. Cons: Does not use industry-standard SQL; no host language interface.

PRODUCT DETAILS

Multi-user runtime licence $A581. Multi-user development licence $A2441. Version tested (2.2) available for IBM PC, XT, AT, or compatibles. Operating system; PC/MS-Dos 1.0 and later. Requires 256K of Ram, two floppy drives. Hard drive recommended for single-user version, hard drive for Lan version. Intelligence (Aust) Pty Ltd, 60-64 Shepherd St, Chippendale. NSW 2008. Tel: (02) 699 3877.

Novell, 3Com after the 'shootout'

Market heavyweights vie for faster, easier Lans

By John Hunter

IT'S BEEN called "the great Lan shootout" — the media blitz mounted by Novell to win the hearts and dollars of the local area network marketplace. Both Novell and 3Com Corp, the two local net market heavyweights, claim to have a faster local area network that is easier to use, and both have submitted statistical data and testimonials.

The name of the game with Lans is performance and efficient resource sharing, and the key to providing both is the operating system that controls the network. Novell's Netware and 3Com's 3+ are excellent operating systems that run on each vendor's respective local net servers. They can also run on IBM Personal Computers under MS-Dos, allowing the Personal Computer to perform as a fairly efficient file server. The vendors differ in that Novell has concentrated on system integrity, while 3Com has put its efforts into communications and inter-network connectivity.

Novell offers five file servers that support up to 16M-bytes of random access memory (1M- or 2M-bytes of zero-wait Ram on the motherboard), 6.1M-bytes of which can be used for memory caching. Up to 16 and 32 disk drives can be attached to Novell's Model 68 and 286 servers, respectively, for a total storage capacity of 2G-bytes. Four Novell servers (Models 286A, T286A, 286B and T286B) use the 16-bit Intel 80286 processor, while another (Model 68B) uses the 32-bit Motorola MC68000 microprocessor.

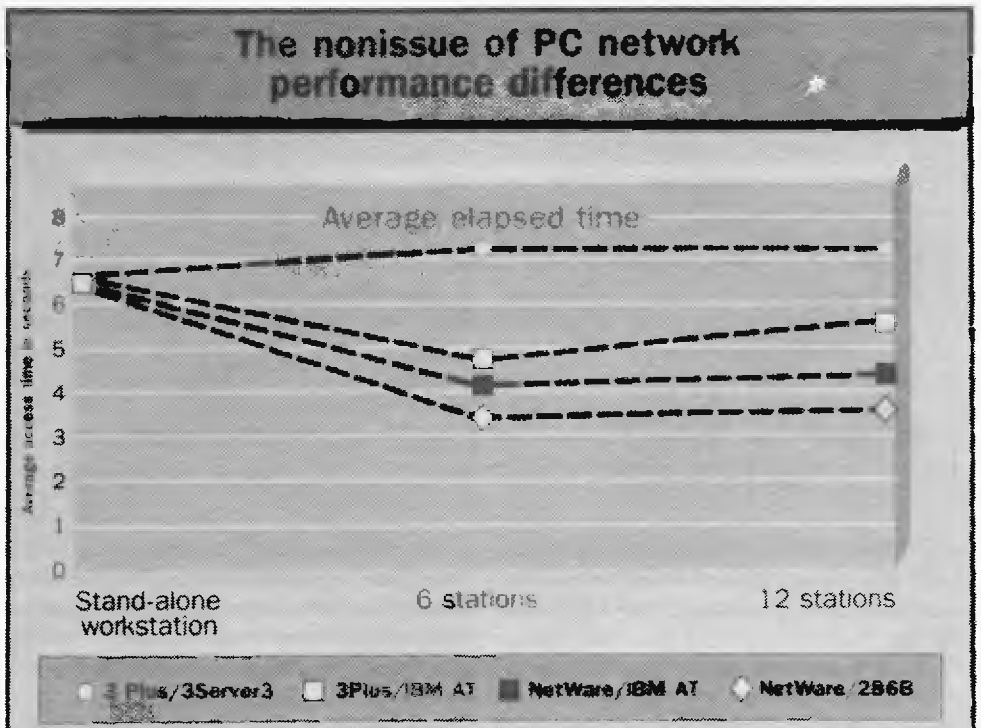
The popular 80286-based 3+3 server from 3Com has a built-in 70M-byte hard disk and 960K-bytes of dual-ported 100 nsec Ram for simultaneous CPU and direct-memory access. Up to 8M-bytes of Ram can be supported via expansion boards, and up to 12 external disk drives can be attached to expand storage up to 910M-bytes.

Common capabilities

Both Netware and 3+ include facilities for handling file and printer sharing, electronic mail, data communications, common network directories and Lan interfacing. It's the sophistication of these standard facilities and the optional ones that make the difference, however. The following analysis is based on using the operating systems with an IBM Personal Computer AT functioning as a server. Unless otherwise noted, all features work equally well on both vendors' dedicated file servers.

When used with personal computers, both operating systems overcome the single-user, single-tasking limitations and lack of memory caching in MS-Dos. Netware and 3+ overcome those limitations through time-slicing user jobs, memory caching and disk elevator seeking. Netware implements directory hashing, where the most frequently used disk addresses are placed in a subdirectory mapped to cache memory. With elevator seeking, the disk controller program examines multiple I/O requests at one time. compares them with the current read/write head position and services the requests to minimise read/write head movement.

The 3+ system also uses elevator seeking. but instead of using directory hashing, it holds all directories in cache memory. Therefore, 3+ should be faster until Netware can establish more refined hash directories. 3+ requires more Ram. but it can handle up to 8M-bytes of cache memory. While 3+ can manage only 1M-byte of Ram, 3Com's 3+Turboshare addresses up to 8M-bytes. 3+Turboshare comes with the 3+3 server and is optional in a personal computer-based file server system. Netware's Version 286 supports up to 16M-bytes of cache memory on an IBM PC AT.



The Seybold Group's office test of Novell, Inc. network servers vs. 3Com Corp. network servers found a 3½-second difference between each vendor's dedicated servers. In comparing networking software on IBM Personal Computer ATs, less than a one-second difference was found for a 6-node network and a 1½-second difference was found with 12 nodes.

SOURCE: THE SEYBOLD GROUP, SAN JOSE, CALIF.

Novell's system integrity is excellent: it offers facilities that are unequalled by 3+. With Netware's System Fault Tolerant (SFT) software, users are protected against faulty disk locations, database "pollution" and complete file server failures. SFT software is offered in three versions of Netware, called Levels I, II and III.

Level I maintains redundant copies of the file allocation tables and directory entries on different disk cylinders for each network volume. Should the directory fail, the server remains operational. When a disk sector failure occurs, data written to the bad sector becomes irretrievable. SFT prevents this by performing a read-after-write verification and by moving data from bad sectors and marking them so that no new data will be written on them. 3+ relies on MS-Dos for disk management. Both the Novell and 3Com disk controllers detect and correct errors; SFT corrects up to 11 bit errors per sector, while 3+ corrects 8 bit-error bursts.

Level II includes all Level I facilities. It also provides second-tier failure tolerance by allowing disk and disk-controller redundancy. Users can switch over to the duplicate disk drive if the primary unit fails. Duplicate controllers offer the same level of system integrity, plus added performance during read/write operations. With a dual-disk, dual-controller combination, split seeks can occur during disk reads. Dual seeking occurs when the operating system examines read/write requests, determines which drive can respond most quickly and initiates commands to permit concurrent read/write operations. Up to three reads and writes can occur concurrently.

The communications facilities of 3+ and Netware both support Personal Computer-to-local net accessing, and both offer IBM 3270 gateways that emulate IBM 3274 controllers and service up to 32 simultaneous sessions. However, 3+ has more sophisticated communications facilities. For example, it can connect an Ethernet to an IBM Token Ring Lan.

Both operating systems use a standard remote personal computer-to-local network interconnect procedure that requires users to manually dial the appropriate telephone numbers and enter logon codes, user identifications and passwords. Both vendors also sell software that lets users store profiles on the personal computer and then handles all connection procedures for them.

Once connected to the Lan, remote users have the same privileges as local users. However, the 3+ system's 3+Share facility makes accessing resources easier; its users can call a service by its name. With Netware, the operator must designate the physical location.

The 3+Route facility, also part of the operating system, can be configured to time-out and disconnect inactive users who have neglected to log off or who have intentionally kept themselves logged on to ensure local-area network access. Autodisconnect frees communications ports and also reduces telephones costs, especially if long-distance charges are involved. Netware is lacking here, also.

The 3+Route supports two serial communications ports when used with a personal computer and up to five when used on the 3+3 server with an optional port expansion board. The ports support autobaud recognition and data rates of 300 to 19.2K-bits/sec for asynchronous dial-in calls and 9.6K-bits/sec for direct connection to the local net through a null modem.

Links

Netware dial-in facilities support two serial ports at up to 9.6K-bits/sec. For extended remote dial-in, Novell requires a separate communications server consisting of a dedicated Personal Computer, a Wide-Area Network Interface Module (WNIM) and communications software. Each WNIM supports four serial ports and up to 12 remote personal computers running simultaneously at 19.2K-bits/sec.

Netware and 3+both have an internal bridge that supports connection to similar local-area networks. The communications protocol is Xerox Network System. 3Com also allows an IBM Token-Ring local-area network to connect to a local Ethernet or to another Token-ring through the 3+NetConnect segment of the 3+operating system. This requires a local net interface card. For Apple Computer's Macintosh users, 3Com offers a link between Apple-Talk and Ethernet. Novell offers no such inter-local net connection facilities.

Novell also does not do well with time-sensitive applications. Under Netware, such jobs are allowed to time-out, while 3+ will spoof terminals awaiting an acknowledgement that a packet has been received. 3+ also has a facility that compensates for the speed variables of the sending and receiving devices and allows a high volume of data to be sent before requiring an acknowledgement.

The choice between Novell and 3Com comes down to what is important to the user. For overall system integrity, Novell is the winner. But for connectivity with other local-area networks and remote personal computer dial-in services, the 3+ gets the nod.

Unisys unveils PC, B25 integration

MILSONS POINT. NSW — Unisys has released a desktop computer based on Intel's potent 80386 chip and has announced enhanced PC integration and clustering capabilities for its B25 family.

A spokesman said the new B38 workstation is able to support up to 11 clustered workstations that. through the use of a new product known as Clustershare. may include IBM PCs and compatible machines. Other resources that can be shared under Clustershare are disks, printers and communications facilities. Clustershare consists of an RS-422 interface addon board and software. which contains both MS-Net and Net Bios compatible with MS-Dos 3.1 and higher. With Clustershare PCs can access remote MS-Dos volumes and printers located on the local master or on other masters in the network.

The B38 runs the Btos operating system release 8.0. It is available in two forms. the B38-CPU and the B38-MCP. which includes an Intel 80287 maths co-processor.

The products for the B25s are the Intelligent Data Communications Module (IDS). the Ethernet Lan Module (B25-ENS), the Ofisdesigner software and a laser printer.

The B25-IDS provides data communications for Unisys workstations. the spokesman explained. It uses an Intel 80186 processor and has 512K-bytes of memory and two communications ports with a cumulative bandpass of 64K-bits/sec. It is controlled by IDMSS. a cutdown version of the Btos operating system which is downloaded to the B25-IDS by the main CPU. Once loaded it is capable of controlling two different concurrent communications protocols, such as B-Multi, SNA SDLC, or X.25, the spokesman said.

The Ethernet Lan module is based on the X-Bus and contains circuitry to interface the Lan network to the CPU. Access to resources on other nodes is via B-Net software. Implementation also requires Lan gateway software that contains the routines that execute on the B25-EN3's processor.

Data General revamps networking strategy

SOUTH MELBOURNE — Data General has taken the wraps off a flexible networking scheme that is able to connect IBM personal computers and compatible machines to mainframes via DG minicomputers.

A spokesman said Personal Computer Integration is a suite of hardware and software products that form part of a three tier approach to networking. It will use DG departmental minicomputers as go-between for personal computer users to link to mainframes.

The networking architecture will include a series of protocols, local area networks, communications software, hardware and utilities, the spokesman said. The minicomputers will act as file servers, disk servers or gateways into corporate networks or other DG computers.

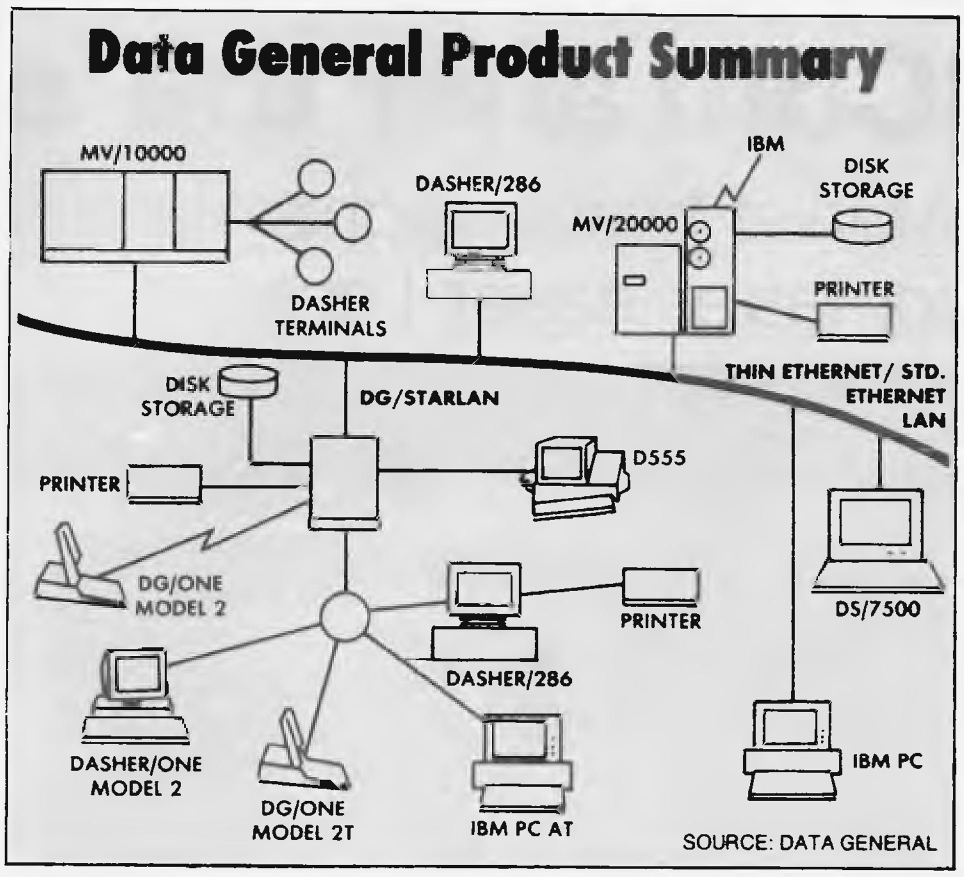
Although additional applications may be required to convert the mini from a file or disk server to a gateway, the fundamental tools will be in place to make the change, the spokesman said.

PCI will adhere to industry networking standards laid out under the Open Systems Interconnect (OSI) program, and will include OSI's X.400 protocols as part of the product set. Through the use of OSI standards, PCI will accommodate other vendors' systems, such as those from DEC and Wang.

DG will leverage its minicomputer connectivity with IBM mainframes to offer customers a desktop-to-mainframe networking solution, the spokesman said.

The release of PCI is expected to be the first of several networking product introductions DG is planning over the remainder of this year, and is part of an overall corporate networking strategy, the spokesman said.

Data General Australia Pty Ltd, 100 Dorcas St, S Melbourne 3205. Tel: (03) 698 6988.



Cosy corner for the Cats

PRAHRAN, Vic — Australian company Cats Company Pty Ltd has developed a system to manage and account for private networks covering voice and data.

A company spokesman said that at its simplest Catcom provides network wide call accounting and directory assistance, but can be expanded to deliver complete management information on all aspects of the network, including usage and cost of private tie lines.

Catcom includes an alarm system that identifies faults on trunk circuits, tie lines and switching equipment, and will warn a network manager of a fault so that problems can be rectified before they get out of hand.

The spokesman noted that Catcom interfaces directly with PBX models from a number of vendors.

The system is based on a Torch Central Network Processor equipped with color bit-mapped graphics screens and a mouse/icon interface. The system runs the Unix operating system.

Cats Company Pty Ltd, 466 Malvern Rd, Prahran, Vic 3181. Tel: (02) 51 1565. Fax: (03) 529 2134.

Development tool for programmers

CHATSWOOD, NSW — A program development tool for co-operative processing on personal computers, local area networks (Lans) and mainframes has been developed by Applied Data Research and released in Australia by Progeni Pty Ltd.

The product, ADR/Adlib, is claimed to enable programmers to modify and enhance a program at a PC/Lan and upload only the changes to the mainframe. It also provides a self-contained development environment for the PC or Lan and supports mainframe environments of other ADR products, such as Roscoe, Vollie and the Librarian, as well as IBM's TSO, a spokesman said.

Using Adlib, programmers can select sections of mainframe software, bring them into a local environment, and return only the changed code to the mainframe. "Programmers can be freed from the constraints of mainframe scheduling or availability by doing mainframe development on a PC", the spokesman explained.

Editing, library management of source and object code, transparent mainframe access and remote job submission capabilities are provided. Program integrity is ensured by preventing access, retrieval or editing of a program by more than one user at a time, the spokesman explained.

Statistical and historical reports including module history, module change, module activity and library directory keep a record of all changes within a program.

Adlib may be bought independently of ADR mainframe software for a single copy price of $A700. It runs on an IBM PC with attached hard disk, PC XT, PC AT or 3270 PC with approximately 350K-bytes of available memory for Adlib software. It requires PC-Dos Version 2.0 or later. For Lan operation it supports IBM's Token Ring network and PC Net.

Progeni Pty Ltd, Chatswood Plaza, Railway Ave, Chatswood, NSW 2067. Tel: (02) 419 6300.

Netdelivery from Hewlett-Packard

BLACKBURN, Vic — Squaring off with IBM, Hewlett-Packard has unveiled minicomputer-based distributed application development tools that it claims provide more functionality than IBM's Systems Network Architecture Distributed Services (Snads). The company also revealed its plans to develop network management applications that could compete with IBM's Netview family.

The Netdelivery/V tools, which have just been released in Australia, provide guaranteed transparent delivery of files and messages between applications residing on one or more HP 3000 Series minicomputers, a spokesman said. If the link is down, the software keeps trying until it gets through, and if a file gets through but the acknowledgement from the receiving system is lost, the receiving system will automatically discard the duplicate file, he added.

Netdelivery supports delivery of data and commands between distributed applications, while Snads is a store and forward document delivery system that is most commonly used for electronic mail applications. In addition, the spokesman noted, Snads offers only three intrinsic commands — Send, Receive and Send Status — but Netdelivery offers 37 commands, including one that allows an application to initiate a host session on a separate system and another that automatically changes the priority of a transmission waiting in a queue to be sent.

Netdelivery/V currently sits on top of HP's Advancenet networking system (Communications World, June, p30). It costs $A7316 for the HP Micro 3000, and $A18,965 for the HP 3000 Series 39 to 70. Hewlett-Packard has also announced that it is considering versions of Netdelivery for the X.400 electronic mail standard, Snads and IBM's SNA.

Hewlett-Packard Australia Ltd, 31-41 Joseph St, Blackburn Vic 3130. Tel: (03) 895 2895. Fax: (03) 898 7831.

Soft Spots

TORRANCE, California — Ashton-Tate is poised to strike at the micro-to-host interconnection markets with a series of data extraction products that will link its dBase III software with databases on IBM and DEC hosts. The products are expected to compete with Lotus' The Application Connection (TAC), which has not yet been released in Australia. Ashton-Tate's dBase Direct/36 will let dBase users access information on an IBM System/36 using other vendors' software. A spokesman would reveal few details, but commented that the products would provide more features than TAC and would operate with DEC Vax systems. The company has already released a simpler data extraction product for the System/36 in the UK.

MOUNTAIN VIEW, California — Sun Microsystems has released networking products that strengthen its workstation connectivity strategy by providing faster links to IBM mainframes. The company has also announced development plans that will combine its Network File System and Tops. The new product is intended to create a link between Apple Macintosh computers and personal computers to supercomputers. In addition, Sun anounced its Open Systems Network, a commitment to pave the way for networking where all connected systems work together as a single large resource.

SAN FRANCISCO — On-Line Business Systems has released a product that allows a PC to communicate directly with Vtam on an IBM mainframe. A spokesman said that communicating with a host through Vtam rather than through TSO or CICS gives better performance and incurs less mainframe overhead. The new product, Excellink/Host-V, has two parts: the MVS Host Server and the PC Requester. They are not compatible with IBM's Server-Requester Programming Interface. PC users can transfer files, access a host file interactively, or write programs to access the host, the spokesman said. Excellink/Host-V costs $US12,500 for up to 25 users at one site. On-Line Business Systems is at 115 Sansome St, San Francisco, CA 94104. Tel: US (415) 391 9555.

WESTBORO, Mass — Macintosh users on an Appletalk network can share files with IBM PCs through the use of Banyan's Vines network operating system and Centram's Tops program. Both Vines and Tops must be installed on an IBM PC or compatible machine, which acts as a bridge between the two operating systems. The IBM PC is attached to the Appletalk network using a network adapter card that Centram provides with the IBM PC version of the program. The bridge can also be used for local processing. Vines runs on most PC networks, including IBM's Token Ring. Banyan Systems Inc is represented in Australia by Information Electronics Ltd, Level 8, 222 Kings Way, S Melbourne 3205. Tel: (03) 690 8788.

BERKELEY, California — The long awaited update to Microphone, the communications software for Apple Macintosh computers, has been released in the US by Software Ventures. Version 1.1 will have improved VT100 terminal emulation and will be bundled with the Glue software from Solutions Inc, which will facilitate the exchange of graphics between Mac programs and will allow software to send normally printed output to a disk file. The company is also considering a multitasking version of Microphone that will allow background communications, and may expand terminal emulation capabilities to include IBM compatibility through 3270 emulation. Microphone is distributed in Australia by Infomagic Australia, 3 Trelawney St, Eastwood, NSW 2122. Tel: (02) 858 4111.

Techway's top 3270 Multiswitch

MILSONS POINT, NSW — A networking system that gives IBM 3270 terminal users access to both IBM and asynchronous hosts with contention switching has been released by Techway Ltd.

The 3270 Multiswitch, produced by Network Systems Corp, operates with existing terminals and software and requires no software modifications or additions, a spokesman claimed. "The port contention feature also allows expansion of the terminal population while limiting the growth rate of controllers," he added.

The 3270 Multiswitch is placed between the terminals and the host's terminal controllers. It handles both 3270 and asynchronous traffic, routing requests and data between appropriate terminals and hosts/controllers.

One switch supports up to 96 connections, depending on the mix of terminals, controllers and host computers. Connection can be via coaxial cable or twisted pair. For larger networking environments, the switches can be daisy-chained together with fibre optic or coaxial cable to provide local area networking capabilities, the spokesman claimed.

Techway Pty Ltd, 61 Lavender St, Milsons Point, NSW 2061. Tel: (02) 929 4988. Fax: (02) 957 6914.

Gandalf's gateway

MILSONS POINT, NSW — A gateway server that enables the Gandalf PACX 200 and 2000 networking nodes to connect directly to computers equipped with DEC's Unibus has been released by Techway Ltd.

The VGS 2518 (Vax Gateway Server) is said to be line compatible with Gandalf's GLM 518 local multiplexers and the internal GLM 2518 multiplexer for PACX 2000 or 200 networking nodes. It is compatible with DEC's PDP-11 and Vax series computers with Unibus and Unibus connectors.

Each VGS 2518 can support 19.2K-bit/sec operations on 16 asynchronous channels via two four-wire twisted pair connections over a 2400 metre range. This pair of connections is claimed to provide protection against a single point of failure.

Techway Ltd, 61 Lavender St, Milsons Point, NSW 2061. Tel: (02) 929 4988. Fax: (02) 957 6914.

Voice messaging range broadened

WATERLOO, NSW — The range of Voice Output Exchange voice messaging systems from VMX Inc has been broadened by the release of an entry level system.

A spokesman for the Australian distributor, Honeywell Ltd, said the Vox 1000 offers a four -to-16 port system with up to 64 hours of voice storage. The device is intended for use in organisations with between 50 and 200 users.

The 1000 uses the same line cards and software as its larger counterparts and can be networked. It also features a remote diagnostic package that allows users to monitor the system and run reliability tests from anywhere in the network.

Messaging features, which are consistent across the Vox range, include send, receive, reply, redirect and broadcast to an individual or a group anywhere on the voice messaging network.

Honeywell Ltd, 863 Bourke St, Waterloo, NSW 2017. Tel: (02) 699 0155. Fax: (02) 690 9416.

The troubleshooting family of McData

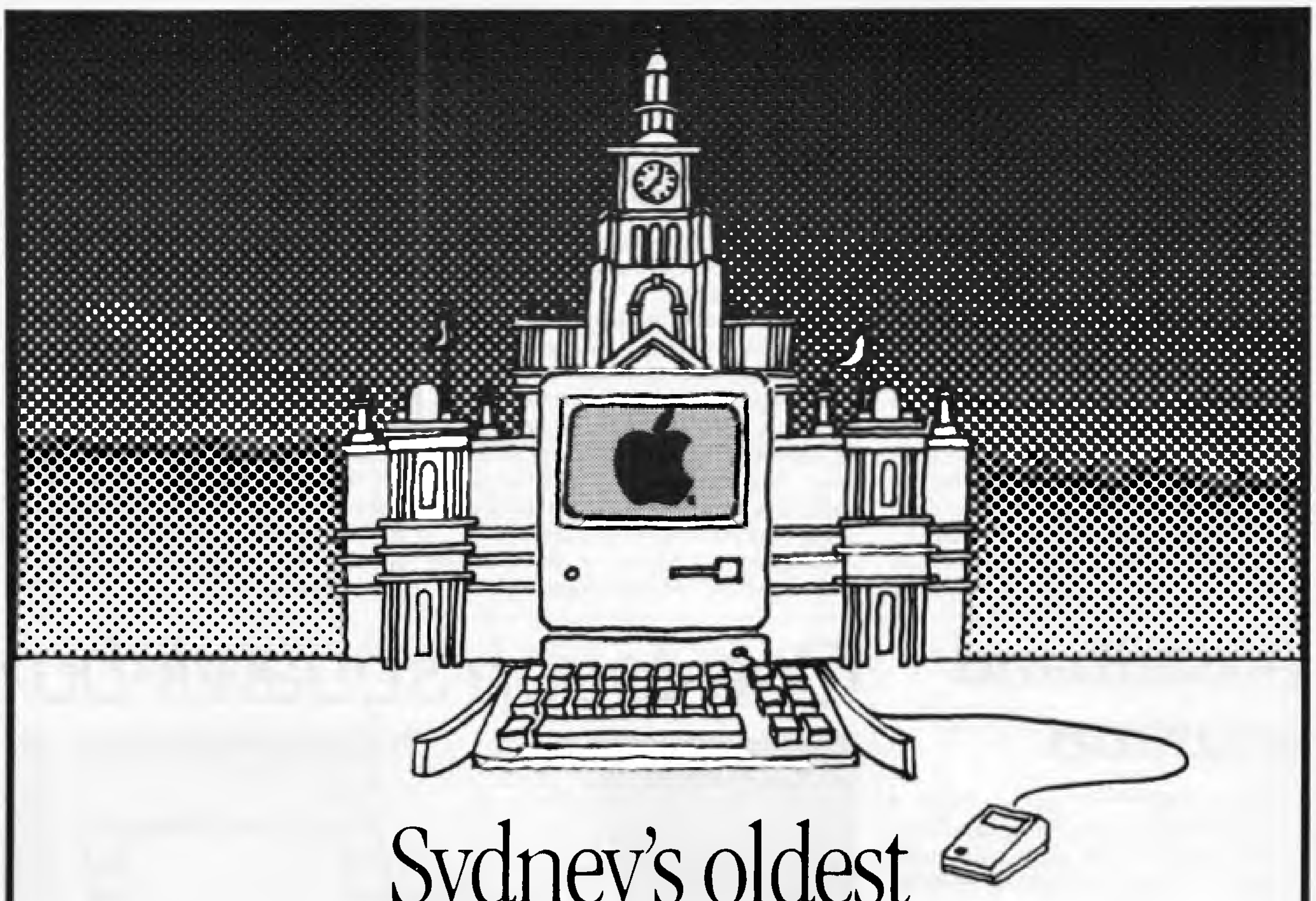
SOUTH MELBOURNE — The McData range of control units and multiplexers is to be distributed in Australia by Datatel Pty Ltd.

A spokesman said the McData MC74 product family provides a complete line of 3270 compatible local and remote control units and a coax multiplexer. "The MC74 supports 3270 protocol at both the network and coax device levels, permiting attachment of devices from a variety of vendors," the spokesman noted.

The MC74 also includes simplified configuration control and remote diagnostics.

A diagnostic port is provided for remote hardware and software troubleshooting, while error and status statistics may be accessed through local control point commands, the spokesman claimed.

Datatel Pty Ltd, 19 Raglan St, S Melbourne 3205. Tel: (03) 690 4000.



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Quad security modem to defy the hackers

OAKLEIGH, Vic — Sendata has released the Quad security modem, which uses a dial back function and encryption to thwart hackers.

A spokesman said the modem supports a common port speed of up to 960bits/sec full duplex and a number of standards, including CCITT, V.21, V.23, V.22, V.22 bis, and Bell 103, 202, 212A and 2400.

Capacity for more than 100 passwords and telephone numbers is included, the spokesman added. When the modem answers an incoming call it asks for a password. If the password is invalid the modem disconnects the caller. If it is valid, the modem again disconnects the caller, but then telephones the number allocated to the password.

The modem can be programmed to call for an extra password after the caller has answered the return call. The modem also supports the DEA method of data encryption, the spokesman claimed.

The Quad security modem costs about $A1450 plus tax.

Sendata, 11 Stamford Rd, Oakleigh, Vic 3166. Tel: (03) 568 6299. Fax: (03) 568 0686.

All eyes on Apple's adapter

SANTA CLARA, California — Apple Computer will improve its links with other manufacturer's computers when it releases in the fourth quarter an Ethernet adapter for the Macintosh II. The adapter was developed jointly by Apple and 3Com Corp, which recently announced plans to release in the US this month.

Apple will market the card as Ethertalk, and is completing companion software that will provide hooks into Transmission Control Protocol/Internet Protocol (TCP/IP) under A/UX (Apple's unreleased Unix for the Macintosh) and support for Appletalk under the Mac's operating system. Both packages and A/UX are due for release in the fourth quarter.

3Com intends to market the same Ethernet card for the Mac II and the Mac SE under a different name and at a slightly lower price. 3Com is represented in Australia by Imagineering. A spokesman said he expected the product to be released about August, coinciding with the availability of a version of 3+ capable of supporting the new Macintosh computers.

An important feature of the Ethernet adapter is that it will give Apple access to the DEC environment and will expand the market for the Macintosh into business where Ethernet is used.

A/UX will not run on Vax minicomputers, but when running over Appletalk and using Ethertalk it will provide the Macintoshes with access to DEC file servers and facilitate file transfer with systems running under DEC's Ultrix operating system. Transparent file exchange between the two environments will be accomplished via TCP/IP and Sun's NFS protocols.

Imagineering, 77 Dunning Ave, Rosebery, NSW 2018. Tel: (02) 697 8666. Fax (02) 697 8670.

Broadband solution

NORTH SYDNEY — The Ethermodem, a product designed to conserve bandwidth on broadband cable plants, has been released by Network Solutions Australia Pty Ltd.

A spokesman said the Ethermodem III/12, which is manufactured by Chipcom Corp in the US, is the first broadband Ethernet product to provide a 10M-bit/sec data rate in a 12MHz broadband channel.

The devices allow organisations with geographically dispersed users to connect Ethernet and IEEE 802.3 computers and local area network devices over a broadband cable system, the spokesman said.

The Ethermodem III/12 series includes two and eight port transceivers that allow Ethernet V2.0 and IEEE 802.3 workstations to attach directly to a broadband cable.

It also includes a remodulator required for signal translation, which will allow at least two broadband Ethernet networks to operate concurrently with Map on the same cable system. The device will be packaged with a removable frequency module for altering frequencies as required.

The Ethermodem II is transparent to higher level network software, such as Decnet, TCP/IP and XNS, the spokesman claimed.

Network Solutions Australia Pty Ltd, 77 Pacific Hway, N Sydney 2060 Tel: (02) 957 2733. Fax: (02) 923 2570.

One-touch squawk-box

SOUTH MELBOURNE — A one-touch, auto-dialling loudspeaking telephone that can store up to 30 telephone numbers, each with 29 digits, has been released by Voca Communications Pty Ltd.

Features of the ADX30 include last number auto redial, a LED display showing the number dialled and the time, date and duration of a call, and compatibility with PABXs.

A spokesman said the phone was able to operate on power from the telephone line, although batteries are needed to protect memory backup. A tone/pulse selection switch is provided.

The ADX30 has a recommended retail price of $A349.

Voca Communications Pty Ltd, 11-29 Eastern Rd, South Melbourne 3205. Tel. (03) 697 7000.

Product Profiles

LANE COVE, NSW — Scitec Communication Systems Ltd has released a compact version of its Mux25 four port statistical multiplexer. The Mux25S is less than half the size of its predecessor, and provides advanced supervisory configuration and diagnostic functions that are terminal activated. Scitec Communication Systems Ltd is at 3 Apollo Place, Lane Cove, NSW 2066. Tel: (02) 428 9555. Fax: (02) 428 5818.

CHATSWOOD, NSW — Digital Equipment Corp and Cray Research Inc have combined to produce a high performance Vax Supercomputer Gateway that is claimed to enable data transfer between Vaxclusters and Cray supercomputers at five times the rate previously available. The gateway is built on DEC's Vaxbi technology and includes a Vax processor, expandable memory, interfaces to Vaxclusters and networks via Decnet, and a special high performance interface to the Cray. Digital Equipment Corporation (Australia) Pty Ltd is headquartered at Chatswood Plaza, Railway St, Chatswood, NSW 2067. Tel:(02) 412 5252.

TOTTENHAM, Vic — An optical fibre multiplexer designed in Australia by Olex Optical Networks has been released in two models, the Fom 2400 and the Fom 4800, which have 24 and 48 channels respectively. A spokesman said the Fom 4800 can accept up to 48 connections and channel the asynchronous data into a single stream for fibre optic transmission. A typical cost for a 48 channel system, including cable connection and a pair of Fom 4800 multiplexers installed over a distance of between 500 and 1000 metres is about $A200 a channel, the spokesman said. Olex is at 207 Sunshine Rd, Tottenham, Vic 3012. Tel: (03) 316 2222. Fax: (03) 314 8515.

ASQUITH, NSW — CVA Computer and Peripheral Sales Pty Ltd has enhanced its Digiboard IBM compatible communications boards. The new versions contain Uarts (universal asynchronous receiver/transmitters) capable of operating at the full 12.5MHz required to keep up with the 80386 processor, a spokesman claimed. Four or eight serial communications channel cards (digiboard Com/4s and Com/8s) and intelligent versions (Com/4i and Com/8i) are available. The cards operate with multi-user operating systems such as Unix, Xenix, Pick and QNX. CVA Computer and Peripheral Sales Pty Ltd is at Unit 2/18 Salisbury Rd, Asquith, NSW 2078. Tel: (02) 476 6400.

BROADMEADOWS, Vic — Ericsson has released a new telephony support product, the Telemis 11 that includes a call accounting module and directory system designed for connection to most PABXs. The system provides information on incoming and outgoing call traffic as well as call destinations and related costs. The system hardware includes two boards developed by Australian company Hypertec Pty Ltd. They are the Hyper 512 MF, which provides extra memory, serial and parallel ports and a realtime clock, and the Hyperace 286Plus which lifts the machines processing speed. Ericsson is at 61 Riggall St, Broadmeadows, Vic 3047. Tel: (03) 301 1313.

NORTH Ryde, NSW — A fibre optic measuring system that uses the insertion-loss metering technique has been released by Philips Test and Measurement. The Optical Power Source OPS-10 and the Optical Power Meter OPM-10 have been developed to allow the accurate attentuation measurement, a spokesman claimed. Depending on the plug-in module used, the power source operates in the range of 850nm, 1330nm or 1550nm. Single or multimode fibres can be connected, and LEDs or laser diodes can serve as a source for chopped or CW-measurements. Philips Test and Measurement is at 25 Paul St, N Ryde, NSW 2113. Tel: (02) 888 8222.

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07 Manager/Supervisor programming
08 Programmer/Methods Analyst
09 Customer Engineering
10 Other engineering
11 DP Sales marketing
12 Other sales marketing
13 Consultants (other than computer consultants)
14 Lawyer/Accountant/Medicine
15 Librarian/Educator
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DEC sets up R&D centre

DEC managing director Frank Wroe . . . part of 10-year plan.

CHATSWOOD, NSW — A $A100 million communications R&D centre will be set up by Digital Equipment Corporation (Australia) Pty Ltd. The Networks and Communications R&D centre is part of a 10 year plan and its charter is to develop computer communications products for use worldwide.

Frank Wroe, managing director of DEC, said the group's first product will be software, but later expansion into a hardware development group is envisaged. He said the group would develop products for the wide area network (Wan) market and will become DEC's worldwide centre of expertise for Wan technology. The first Wan product is already under development and a second will be started within six months. Sales of products developed in the centre are expected to begin in 1988.

The centre will be managed by Bob Starkey, who was formerly engineering manager of DEC's Computer Special Systems engineering group. The group is expected to employ more than 100 engineers and support staff within two to three years. DEC has made a commitment to take on Australian staff and offer cadetships and graduate employment opportunities at the centre.

Senator John Button, Minister for Industry, Technology and Commerce, welcomed the company's boost to its offsets program.

Exports to reach $A200m by 1992

CANBERRA — The growth in overseas markets for Australian products is expected to push the exports of communications equipment to $A200 million a year by 1992 and to $A600 million by 1996. These figures released by the Australian Trade Commission along with an export development strategy, represent a tenfold increase on exports for 1985/86.

Austrade's strategy has pinpointed South-East Asia, North America, Europe and China as the areas of best export potential for Australian communications equipment suppliers. It has also identified as the biggest potential exports earners rural telecommunications systems, network monitoring equipment, mobile radios and specialist business systems.

In developing the strategy, Austrade examined the $A1200 million Australian industry and found it to be dominated by AWA, Ericsson, Philips, Siemens, STC, Plessey, Datacraft and NEC, all but two of which (AWA and Datacraft) are subsidiaries of overseas communications groups. In addition, Austrade found 250 companies producing specialised equipment and undertaking work for the larger companies.

The strategy noted six strengths of the local industry:

- Access to overseas technology through multinational subsidiaries;
- Telecom's high international standing;
- Australia's high level of expertise in rural and remote communications;
- Development of submarine optical fibre systems to meet overseas telecommunications requirements has substantial overseas market potential;
- Australia's position at the leading edge of the application of satellite technology in this region; and
- Significant sales in South East Asia of specialist business systems developed in this country.

Not all was so rosy, however, and the strategy pinpointed several impediments to improved export performance, including:

- Poorly implemented local purchasing policies in government organisations;
- A lack of extensive distribution networks in overseas markets and a limited home market in which to develop the wherewithal to exploit overseas markets; and
- Limited R&D by some Australian companies.

The basis of Austrade's strategy is the development of a co-ordinated approach with Telecom and the industry to penetrate overseas markets. The commission believes that the highly competitive overseas markets, where major companies are bidding for large contracts, combined with the small scale of the Australian industry make such collaborative ventures essential.

To achieve its export targets the commission proposes the co-operative approach supported by its own promotional activities.

The strategy paper may be obtained from Austrade offices in all State capitals and some other large cities.

Netcomm signs up Imagineering

NORTH RYDE, NSW — Modem manufacturer Netcomm Australia has rationalised its Australian retail distribution arrangements by signing up Imagineering to handle the Smartmodem and In/Modem products.

"We aim to get the widest possible distribution coverage from Netcomm products in the high volume consumer market and to boost the level of customer support at distributor level," said Netcomm's managing director Chris Howells.

Netcomm already maintains a telephone-based technical support department for dealers and endusers. Imagineering will expand its dedicated technical support hotline facility for the products.

Howells said his company would continue to develop its OEM supply program and to foster its export markets.

Ericsson wins quality award

BROADMEADOWS, Vic — LM Ericsson has been granted a quality assurance certificate under Standard AS1821 of Telecom's Approved Firms Scheme. The certificate applies to all products Ericsson supplies to Telecom from its Broadmeadows and Morwell plants. Lars Estberger, Ericsson's managing director (left) is pictured receiving the award from Telecom's managing diretor Mel Ward. Estberger said that the award was a major achievement for the company because Standard 1821 was an international standard reference.

Industry Insight

BAYSWATER, Vic — Australian manufacturer Data Cable Pty Ltd has changed its name to Dacos Pty Ltd to reflect the changing nature of its business. The company will continue to trade through the data cable division, which provides coaxial and fibre optic cable assemblies and ancillary equipment; the business systems division and the electronics division. Dacos is at 538 Mountain Hway, Bayswater, Vic 3153. Tel: (03) 729 0044. Fax: (03) 729 1900.

SURFERS PARADISE, Qld — The Fifth World Computer Security Conference IFIP Sec'88 will be held at the Conrad International Hotel and Jupiters Casino in May, 1988. The conference is expected to attract more than 400 experts from Australia and overseas. The theme of the conference will be Computer Security in the Information Age. Further information can be obtained from Dr Bill Caelli of Eracom. Tel: (075) 56 0911. Fax: (075) 35 0599.

LONDON — Amdahl Corp and Nixdorf AG have agreed on a three year joint project to improve the connectivity of the Unix operating system. The agreement is expected to yield a range of shared and independent products for the two companies, who will work on the projects at Amdahl's headquarters in California. The outcome of the project is expected to allow applications to run on a number of different operating systems, providing interconnection between different makes of mainframe, a spokesman said. He added that both companies expect to steal market share from IBM as a result.

PARIS — Ing C Olivetti and Co has created a joint venture in value-added telecommunications services with the publishing group L'Espresso and Seat, a State owned company that specialises in publishing telephone directories. The two will offer electronic delivery of economic and statistical data in Italy.

PROVO, Utah — Novell Inc is offering three million shares of common stock at $US21 a share. Net proceeds of the offering will be used for the repayment of debts, for working capital and for general corporate purposes, a company spokesman claimed.

ARMONK, New York — IBM has reduced its partial ownership in Intel Corp by selling 8.9 million shares back to Intel. The sale netted IBM $US361.5 million and reduced its stake in Intel to 11.5 per cent. On completion of a previously announced exchange of 7.8 million shares of Intel stock for Eurobonds, however, IBM's stake would be reduced to 5.9 million shares, or less than 5 per cent of Intel. IBM has acquired rights to selected Intel chips, and is also Intel's largest customer.

TOKYO — Nippon Telegraph and Telephone Corp (NTT) has reported a profit of 357,960 million yen ($US2500 million) on revenue that reached 5,350,000 million ($US37,400 million) for its 1986 financial year, which ended on March 31. In its second year of privatisation, NTT's before tax profit showed a 13.2 per cent surge over 1985 levels , while sales grew only 5.1 per cent. After tax profit of 148,100 million yen ($US1030 million) was only slightly better than the previous year's result of 140,600 million yen ($US983.4 million). For its 1987 financial year NTT is predicting a decline of 100,000 million yen ($US700 million) due partly to a rate cut for weekend telephone services.

IBM shifts systems marketing strategy

DALLAS, Texas — IBM has dramatically shifted its systems marketing strategy to support other vendors' products. Company executives told a recent gathering of corporate customers that the company would aggressively help the users integrate non-IBM equipment with IBM products across its entire product line.

"IBM is saying it will support open technology in companies that are connected to or using non-IBM products," said one of the users. "It is claiming that it will be more of a multivendor environment, where in the past there were definite lines drawn between IBM and non-IBM equipment." The user added that IBM had told him that if his company buys equipment from other vendors, it will ensure that it works with existing IBM machines.

All users at the forum were required to sign nondisclosure statements forbidding them to give details of the proceedings to the press. However, a number of the users said they had been given detailed product specifications as well as information about emerging technologies and strategic plans for the next three to five years.

"They talked about enough products to fill the gaps in their product line — from PCs to mainframes — to keep anyone happy," one admitted. "And that included a detailed timetable of product availability."

IBM claimed its willingness to work with other vendors' products is not a new policy. "Since the mid-1950s IBM has had a systems integration strategy to address the needs of customers that use non-IBM equipment," a spokesman noted. He added, however, that it has only been in the past year that the company has actually structured itself to address integration.

JNA gets Telecom authorisation

CHATSWOOD, NSW — Telecom has awarded JN Almgren Pty Ltd its Category A (DCE) authorisation, giving the company the right to self-certify communications equipment and to authorise the connection of its equipment directly to dial or leased lines.

The authorisation extends the Category A classification JNA has had for some time.

Bill Stacey, modem project manager with JNA, said that in the past 12 months the company had provided communications equipment for some of Australia's big corporations, and had been producing special products for the banking industry's pilot EFT-POS networks.

In addition, JNA equipped National Mutual Royal Bank with the AS100 network switch which supports both DDS and Datel connections.

Terminal links

NORTH SYDNEY — Australian communications equipment manufacturer Hypercom has formed an agreement with NCR Australia to provide links between Hypercom's PST 150 terminal and NCR's 2155 Midline programmable terminal.

An NCR spokesman said the PST 150 terminals are equally suited for operation in debit, authorisation or data capture and mixed transaction environments. Communications options include X.25, SNA and local area networking.

Credit card processing boost for Idaps

NORTH SYDNEY — Information systems processing and software company Idaps Australia Ltd expects to write new credit card processing business worth around $A400,000 in the first half of this financial year after regaining the accounts of two major Visa card issuers.

John Dougall, managing director of Idaps, said the company has regained the business of Banque Nationale de Paris and the National Mutual Royal Bank. Additionally it has picked up the business of Standard Chartered Finance Ltd and the Canberra Building Society.

To support the new business the company has created two separate business units, the Banking Services bureau and Idaps Software.

Dougall said the increase in the credit card business was the result of a $1.2 million investment in hardware and software in 1986.

John Dougal, managing director of Idaps.

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Previously unpublished papers addressing any of the objectives of the conference should be sent to either of the co-chairmen of the Papers Committee. Persons in industry are particularly encouraged to submit papers on their work. Papers will be reviewed by a refereeing panel and are due by July 17, 1987. Authors will be given an opportunity to modify their papers. Notification of acceptance will be by September 1, and final copy is due by October 1.

Papers should be sent to either of the Papers Committee co-chairmen:

Professor John Gero
Dept Architectural Science
The University of Sydney
Sydney NSW 2006
acsnet:john@archsci.su

Dr Robin Stanton
Dept of Computer Science
Australian National University
Canberra ACT 2601
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TCP/IP — A step toward OSI?

This column is part of a regular series written and inserted by **Network Solutions Australia Pty Ltd.** *Its aim is to highlight and provide information on solutions currently available to Australian communications users in the data comms field.*

While the ongoing development of Open Systems Interconnection (OSI) protocols offers the promise of a universally accepted standard for computer communication, TCP/IP is already here providing the necessary functions for networking multi-vendor products. The TCP/IP communications protocols were originally developed for DoD's Advanced Research Projects Agency's network (the ARPANET), a packet-switched wide area network. However, TCP/IP gained widespread use in the LAN area when it was included as an integral part of the Berkeley UNIX version 4.2 operating system. The subsequent adoption and frequent use of UNIX 4.2 based workstations in computer aided design, manufacturing and engineering environments brought TCP/IP and Ethernet along as the de facto standard for workstation communications. TCP/IP is currently supported by more than 100 vendors of computer systems and is widely used in both the government and commercial sectors.

The Standardisation of TCP/IP Protocols

TCP/IP protocols have evolved from the ARPA research community. Unlike XNS which was developed specifically for LANs, TCP/IP was designed for wide area networking and then adapted to LANs. The protocol development activities are co-ordinated through ARPA's Internet Advisory Board (IAB). The IAB consists of the ARPA program manager, officers, and chairmen of technical working committees (Task Forces). The task forces generate and develop new ideas, monitor the protocols on the ARPANET and recommend additional research activity. Before a proposed protocol is accepted for use on the ARPANET, it is discussed, reviewed, and often revised by the IAB and its task forces. This dialogue is captured in a set of technical notes known as Internet Experiment Notes (IENs) and Requests for Comments (RFCs). Some of these IENs and RFCs then become the "official" specification for protocol standards.

The Department of Defence (DoD) took further steps to standardise these protocols for their operations Defence Data Network (DDN) by issuing a set of "MIL-STD" specifications based on the above RFCs. These MIL-STD protocols have essentially the same functionality as those described in the above RFCs except it is documented in a formal way.

The Defence Communications Agency (DCA) under DoD at one time considered certifying vendor products according to the MIL-STDs. However, in the recent Monterey TCP/IP vendors' workshop, the CA abandoned this plan and officially turned over to the commercial sector responsibility for achieving multi-vendor interoperability. As a result, the Coalition for Working Systems (CWS as opposed to COS, Corporation for Open Systems in the OSI world) was formed to investigate alternatives for providing certification services and to provide a forum between vendors of TCP/IP products. CWS members include Bridge, Wollongong, CMC, Excelan, Scope, and other TCP/IP vendors.

TCP/IP Protocol

The architecture of the TCP/IP protocol set is similar to, but not identical with, the ISO seven-layer Open Systems Interconnection architecture. The initial TCP/IP work actually predated the ISO Reference Model. At the lowest levels are the Network Access Protocols. These correspond to the OSI Physical and Link Layer protocols. They define the rules to access local area networks such as the Ethernet; wide area networks such as the X.25 DDN; and ARPANET using the BBN 1822 link protocol. The Internet Protocol corresponds to OSI's Network layer. It includes such functions as a global addressing structure (ie, the 32-bit IP address), types of services, and fragmentation/reassembly of packets too large for a network to handle. The Transport Protocols provide an end-to-end data stream service. Two services are available to the applications programs: the Transmission Control Protocol (TCP) which provides a reliable transmission of data, and the User Datagram Protocol (UDP) which provides a transaction-oriented, best-effort service. Finally, at the upper layer, applications services are provided such as file transfer (FTP), virtual terminal (Telnet), and electronic mail (SMTP).

Network Access Protocols: The TCP/IP protocols have been implemented on top of different network technologies. They range from point-to-point networks such as the ARPANET and X.25 public networks, to packet radio networks, satellite packet switched networks and local area networks such as Ethernet and broadband networks. Each of these technologies offers different network interfaces and performance requirements. In the local area environment, TCP/IP is most often associated with Ethernet but can be used on any network technology.

Internetwork Protocols: The Internet Protocol (IP) is responsible for routing packets between network stations, and for store-and-forward of data across gateways (ie, the GS/3-IP router). It defines the rules to interconnect networks (ie Ethernets or X.25 networks) together to form an internet. Network stations can then send packets through the internet system without regard to the network on which the destination node resides, by having the station send the packet to a gateway on the same network as the source station and letting the gateways take responsibility for determining how to deliver the packet to the final destination network and thereby the destination node. Thus, the IP contains information allowing it to make routing decisions. In addition, it is able to employ the appropriate network access protocol to send packets across networks to which it is attached.

The key feature of IP is the Internet Address, a 32-bit addressing scheme which includes a network and a host number. There are three different types of Internet addresses: Class A, Class B, and Class C addresses. Class A addresses have a 7-bit network number and a 24-bit host number. Class B addresses have a 14-bit network number and a 16-bit host number. Class C addresses have a 21-bit network number and 8-bit host number. The network number allows a station to determine if the packet is destined for the same network or across the internet. To route internet packets, the IP module employs a routing table containing the addresses of the appropriate gateways. For local network packets, IP calls on the Address Resolution Protocol (ARP) to map the IP host number to a 48-bit Ethernet hardware address.

The MIL-STD 1777 Internet Protocol also defines a number of options that are rarely supported in the commercial world. They include:

- Security — used to carry DoD security information
- Loose Source Routing — used to route packets based on information supplied by the source. However, the gateway can make routing decisions if necessary.
- Strict Source Routing — used to route packets based solely on information supplied by the source.
- Record Route — used to trace the route an internet packet takes.
- Stream ID — used to carry the stream identifier.
- Internet Timestamp — used to insert timestamp information as packets route through the internet.

To control a large and complex internet, an adjunct protocol to IP has been developed called the Internet Control Message Protocol (ICMP). The ICMP provides the facility to carry out interaction between network stations and gateways, as well as with network control servers by exchanging control messages. It includes functions such as redirect messages to permit gateways to notify network stations that they should send packets to a different gateway. Other ICMP messages described in RFC 792 include:

- Destination Unreachable
- Echo Reply
- Source Quench
- Time Exceeded
- Parameter Problem
- Time Stamp Reply
- Information Reply

Transport Protocols: One of the prime uses for data communication networks is the ability to reliably transmit and receive terminal traffic files, and electronic mail. One characteristic of such use is the necessity of passing a fairly large amount of data (typically more than would fit into a single network packet) reliably and being able to reconstruct the data in sequence. To support such internet services, the Transmission Control Protocol (TCP) was developed.

TCP provides an end-to-end reliable data stream service. It contains mechanisms to provide reliable transmission of data. These mechanisms include sequence numbers, checksums, timers, acknowledgements and retransmission procedures. The intent of TCP is to allow the design of applications that can assume reliable, sequenced delivery of data.

Application Protocols: Clearly, the purpose of all the communications protocols is to provide services for the upper layer applications. A number of application protocols have been defined in the TCP/IP environment to support terminal access over the network, file transfer, electronic mail, and name services.

Telnet is the remote terminal access protocol. It allows the use of a terminal server, or a terminal on one host with a program on another host. It is based on three ideas: a Network Virtual Terminal (NVT), negotiated options, and the symmetry of process. Telnet is built on the services provided by TCP.

The NVT idea is used to define an imaginary terminal as the standard terminal. Then all real terminals are mapped by the Telnet implementations into or out of this imaginary standard. The NVT defines a simple 7-bit ASCII terminal that provides half-duplex and line-buffered mode operation.

Telnet actually is implemented in two modes: User (Client) Telnet and Server Telnet. User Telnet interacts with the user terminals. It converts the characteristics of real terminals to the NVT and vice versa. Server Telnet interacts with the process and applications in a host. It acts as a surrogate terminal handler so that remote terminals appear as local terminals to the process or application.

The File Transfer Protocol (FTP) is based on a model of files having a few attributes and a mechanism of commands and replies. The command and reply mechanism is used to establish the parameters for a file transfer and then to actually invoke the transfer. Like Telnet, FTP runs on top of TCP and thus assumes the reliable service provided by TCP.

For more information on how TCP/IP local area network systems may help you, please contact the Network Solutions office in your State.

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